



CAFFEINE AND HEALTH

Strange as it may seem, the most widely consumed drug in the world is not alcohol, marijuana or even cocaine – it is caffeine! Caffeine is a stimulant that is found in the leaves, fruits and beans of some plants. The most popular caffeine containing plants are coffee (beans), the kola nut and teas.

In this issue of **Nyam News**, we will examine the effect of caffeine on health and well being and determine if there are any benefits to be derived from the consumption of this naturally occurring alkaloid.

Commercial Uses of Caffeine

Caffeine is found in many commercially prepared beverages and foods – coffee, tea, soft drinks, chocolate and energy drinks. The following table shows some popular caffeine containing products and their uses.

Biochemical Properties

In the human body, caffeine acts on the central nervous system where it competes with adenosine for the adenosine receptors. Normally, when adenosine binds to its receptor, it sends signals to nerves and the brain which cause a reduction in nerve cell activity and the dilation of blood vessels. When caffeine takes the place of adenosine,

these signals are not sent. Instead, nerve cell activity increases and blood vessels constrict. This leads to the initiation of the adrenaline response by the pituitary gland. Norepinephrine and to a lesser extent epinephrine are released which increase the heart rate and breathing, increases blood pressure and readies the body for fight or flight. This explains the most common side effect of

Product	Uses
Energy Drinks	To energise the body and increase mental alertness.
Energy Pills	To energise the body and increase mental alertness.
Diet Formulations	To aid in fat metabolism and increase endurance.
Performance Enhancers	To increase endurance and mental alertness.
Some Migraine Formulations	To constrict the blood vessels in the brain.

caffeine ingestion which is the feeling of increased energy.

The effects of caffeine can be felt within less than one hour of ingestion. The amount of caffeine required to produce a change will vary from person to person, depending on body size as well as the degree to which the person has become tolerant to caffeine. Experiments have been done to find out just how much caffeine is required and for how long, in order to cause tolerance. Complete tolerance to sleep disruption was observed after consumption of 400 mg caffeine, three times per day for seven days but develops more quickly among heavy coffee or energy drink consumers.

Is Caffeine Good or Bad for Health?

There is no simple answer to this question as there are both positive and negative effects to be derived from consuming caffeine. The following list takes a look at the relationship between caffeine and various conditions and gives a concise outline of the scientific evidence that exists.

- **Caffeine and Physical Endurance**

Studies show that caffeine enhances a person's capacity to

do physical or mental labour by increasing central nervous system activity and mental acuity. This in turn provides an energy boost during physical activity and lessens the physical symptoms of fatigue. Studies have shown up to a 51% increase in cycling endurance for athletes after ingesting caffeine at 9 mg caffeine/kg body weight. Other studies suggest that this result is seen mostly in athletes who do not regularly use caffeine.

Caffeine has also been said to reduce the need for sleep. While it does not negate the need to sleep, it interferes with the signals which induce the sensation of sleepiness thereby keeping you awake longer and shortening the amount of sleep you get. For some persons, caffeine consumption may lead to insomnia.

- **Caffeine and Type II Diabetes Mellitus (DM)**

There is a relationship between regular coffee consumption and Type II DM.

After analyzing data on 120,000 people over an 18-year period, researchers at Harvard have concluded that drinking 1 to 3 cups of caffeinated coffee each day can reduce diabetes risk

by several percentage points, compared with not drinking coffee at all.

According to one research team, 14 out of 18 research papers showed that frequent coffee intake was associated with a decreased risk of Type II DM. However, they also noted that the higher the consumption of coffee, the greater the decrease in the risk.

In these studies though it is important to note that it was coffee and not caffeine that was used. Caffeine is only one of the constituents of coffee and as such it is difficult to determine whether the caffeine or some other chemical in the coffee was responsible for the protective effect.

In a 2008 study, 10 regular coffee drinkers were tested. Instead of coffee, they were given 2 caffeine pills equivalent to 500 mg caffeine. On another day, they were given 2 placebo pills. Their diet on both days was similar. The participants all had Type II DM and were managing it using diet, exercise and oral agents, but no insulin. It was found that the caffeine increased their blood glucose levels both after meals and during the day in general, compared to the days when they did not have any caffeine. Another study showed that a consumption of 5mg caffeine/kg body weight



along with a high carbohydrate meal increased insulin insensitivity after a second meal. This means that the body became less efficient at removing glucose from the blood showing that people who are managing their Type II DM and who regularly consume caffeine may be compromising the efficiency of their treatment.

- **Caffeine and Parkinson's Disease**

As part of a long-term study of the Honolulu Heart Programme, a team of researchers examined the relationship between coffee intake and the incidence of Parkinson's disease. Researchers studied 8,004 Japanese-American men over a 30-year period. Of these men, 102 developed Parkinson's disease. Men who drank the most coffee were the least likely to get Parkinson's disease. Consumption of caffeine from other sources such as green tea, black tea, chocolate and soda was also associated with a lower risk of Parkinson's disease.

Although this research is suggestive of a link between caffeine and Parkinson's disease, it is too early to say that caffeine will prevent Parkinson's disease since further experiments are required in order to establish a causal link.

- **Caffeine and Pregnancy**

There have been many studies aimed at determining the link between caffeine intake and foetal development the development of neural tube defects, deformities and the likelihood of miscarriage.

Some studies claim that there is an increased risk of miscarriage and development of neural tube defects and spina bifida with caffeine intake.

Others state that the risk is similar in women who ingest caffeine and those who do not during pregnancy.

As with many of the studies involving the effect of caffeine they did not look specifically at caffeine intake, but primarily involved coffee drinking. The possible interaction with other chemicals in coffee was not always examined. Some researchers also note that differences in lifestyles may not have been properly accounted for.

While it is difficult to define a precise value of acceptable caffeine intake, general recommendations now state that women who are pregnant should try to consume no more than 200-300 mg caffeine/day in total (including all beverages, foods and medications).

- **Caffeine and Weight Loss**

A few studies indicate that drinking coffee or tea with caffeine may slightly boost weight loss or prevent weight gain. However, for those tempted to try caffeine to aid weight loss it is important to know that some caffeinated beverages are also high in calories and fat.

Although research about caffeine and weight loss is not definitive, researchers have several theories about how caffeine affects weight:

- ♦ **Appetite suppression:** Caffeine may reduce your desire to eat for a brief time, but there is little evidence showing that long-term consumption results in weight loss.
- ♦ **Calorie burning:** Caffeine increases the body's metabolic rate and thermogenesis but it is unclear how much weight

loss can be attributed to these factors.

- ♦ **Water loss:** Caffeine acts as a diuretic. This water loss may temporarily decrease your body weight.

- **Caffeine and Alcohol**

With the massive emergence of the energy drink culture has come a new type of cocktail energy drinks and alcohol. Despite warnings on some drink labels against mixing with alcohol, the trend of using energy drinks as chasers is only increasing.

Mixing alcohol (a depressant) with caffeine (a stimulant) is assumed by many to result in a counterbalance of effects. Research has shown that this is not fundamentally so. Studies show that alcohol increases reaction time and the amount of errors made when doing consecutive tasks. When caffeine is administered along with the alcohol, reaction time decreased.

In 2006, 4,271 college students were surveyed regarding their alcohol consumption patterns. Those who reported consuming energy drinks mixed with alcohol were more likely to have twice as many episodes of drunkenness than others, and were also more likely to experience adverse alcohol related consequences including being taken advantage of sexually, taking advantage of others sexually, riding with an intoxicated driver, becoming injured or requiring medical attention.

Although further research is needed, there is enough information available to support the

warning against mixing alcohol with highly caffeinated beverages since drinkers may end up consuming more alcohol as the feeling of drunkenness is inhibited.

Drink Caffeine in Moderation

While a cup of coffee or a soft drink may not lead to any negative health effects, when daily consumption

of caffeine becomes abusive and constant, the body usually suffers. It is advised that we limit ourselves to less than 500 mg/day. Withdrawal symptoms are common among those who are aiming to decrease their caffeine intake. Common withdrawal symptoms include headache and nausea, anxiety, irritability, inability to concentrate and diminished motivation.

For further information contact: Caribbean Food and Nutrition Institute.

Beverages	Package size (oz)	Caffeine/Unit (mg/oz)	Caffeine/Package (mg)
5 hour energy	2	69	138
7-Up	12	0	0
Arizona Green Tea Energy	16	12.5	200
Brewed coffee	8	13.4	108
Brewed decaf coffee	8	0.7	6
Chocolate milk	8	0.6	5
Coca cola classic & Coke zero	12	2.9	35
Diet Coke	12	3.8	45
Diet Pepsi	12	3.0	36
Green tea	8	3.1	25
Instant decaf coffee	8	0.3	3
Lipton iced teas	20	2.5	50
Monster/Monster Energy	16	10	160
mixxd energy			55
Mountain Dew	12	4.6	
Pepsi-cola	12	3.2	38
Red bull	8.46	9.5	80
Sprite	12	0	0

Tablets	Caffeine/Tablet (mg)
Dexatrim	200
Excedrin & Excedrin Migraine	65
Hydroxycut Hardcore	100
Midol Menstrual	60
One a day Energy & One a day women's active metabolism	120

Food	Caffeine Content
Haagen-Dazs Coffee Ice Cream	48 mg/8 oz. cup
Hershey's Kisses	1 mg/kiss
Hershey's Special dark	18 mg/1.45 oz. bar
Kit Kat	6 mg/ bar
Reese's Peanut Butter Cup	4 mg/cup
Unsweetened baking chocolate	23.2 mg/ 29 g square