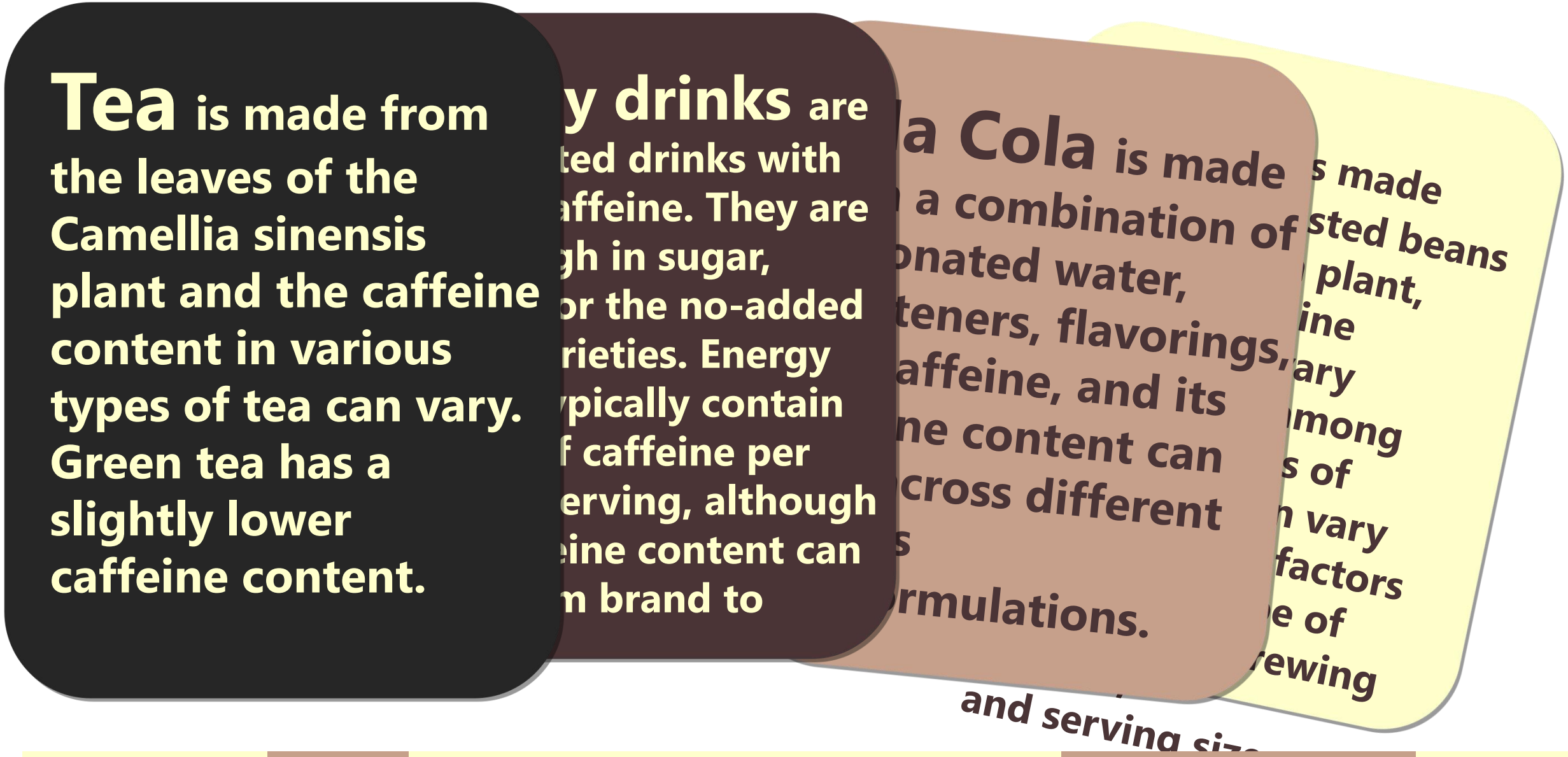
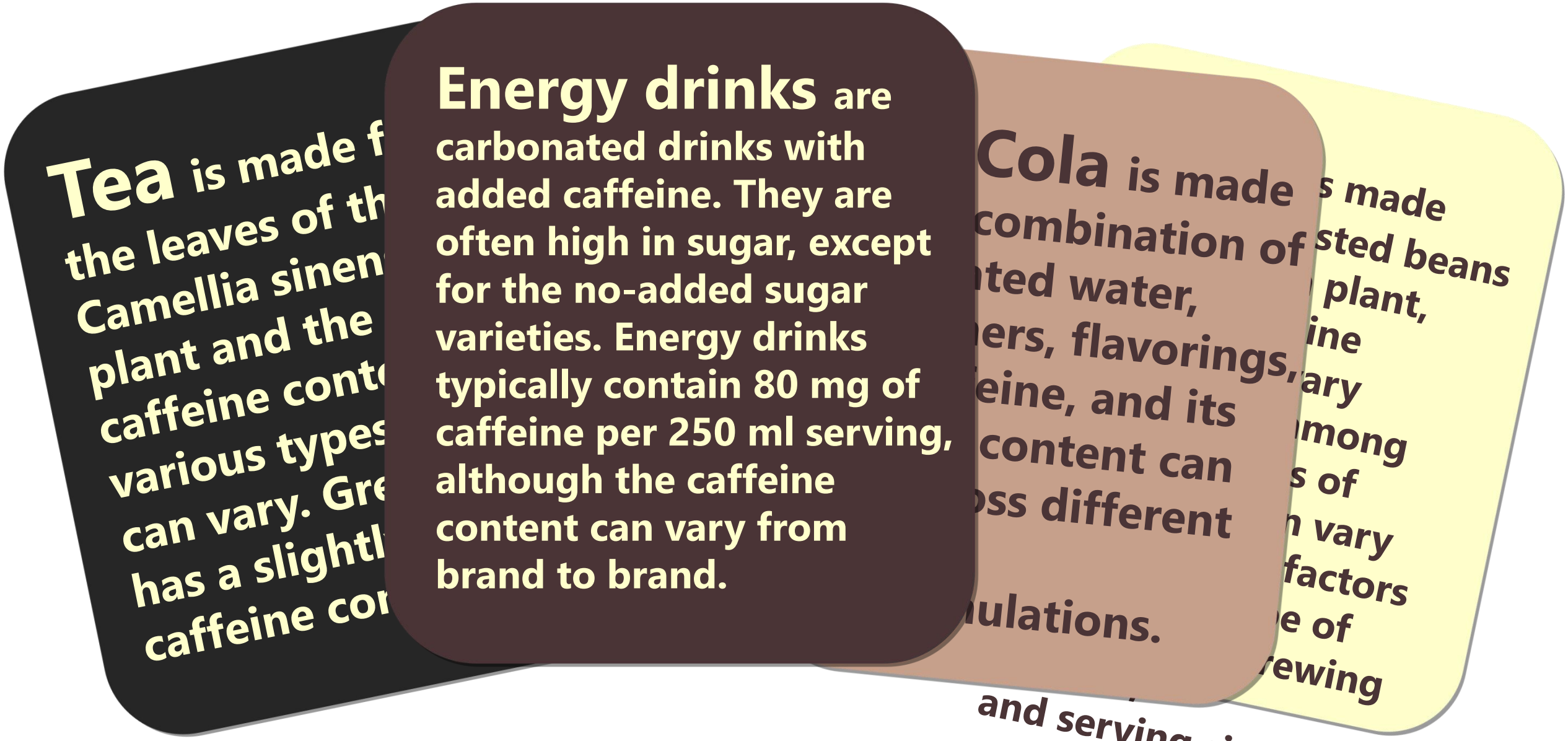

caffeine

Caffeine

is naturally found in the leaves, seeds, and fruits of many plants, including tea leaves, cocoa beans, coffee beans, guarana, and kola nuts. That means caffeine is present in coffee and coffee-flavored foods (e.g., tiramisu, coffee-flavored ice cream, and other coffee-flavored snacks and sweets), as well as in tea (except rooibos and herbal teas) and chocolate and chocolate-flavored foods and beverages. Caffeine is also added to some beverages (e.g., colas and energy drinks), supplements (e.g., sport and weight loss supplements), and medicines.



Presence of caffeine in different drinks and food



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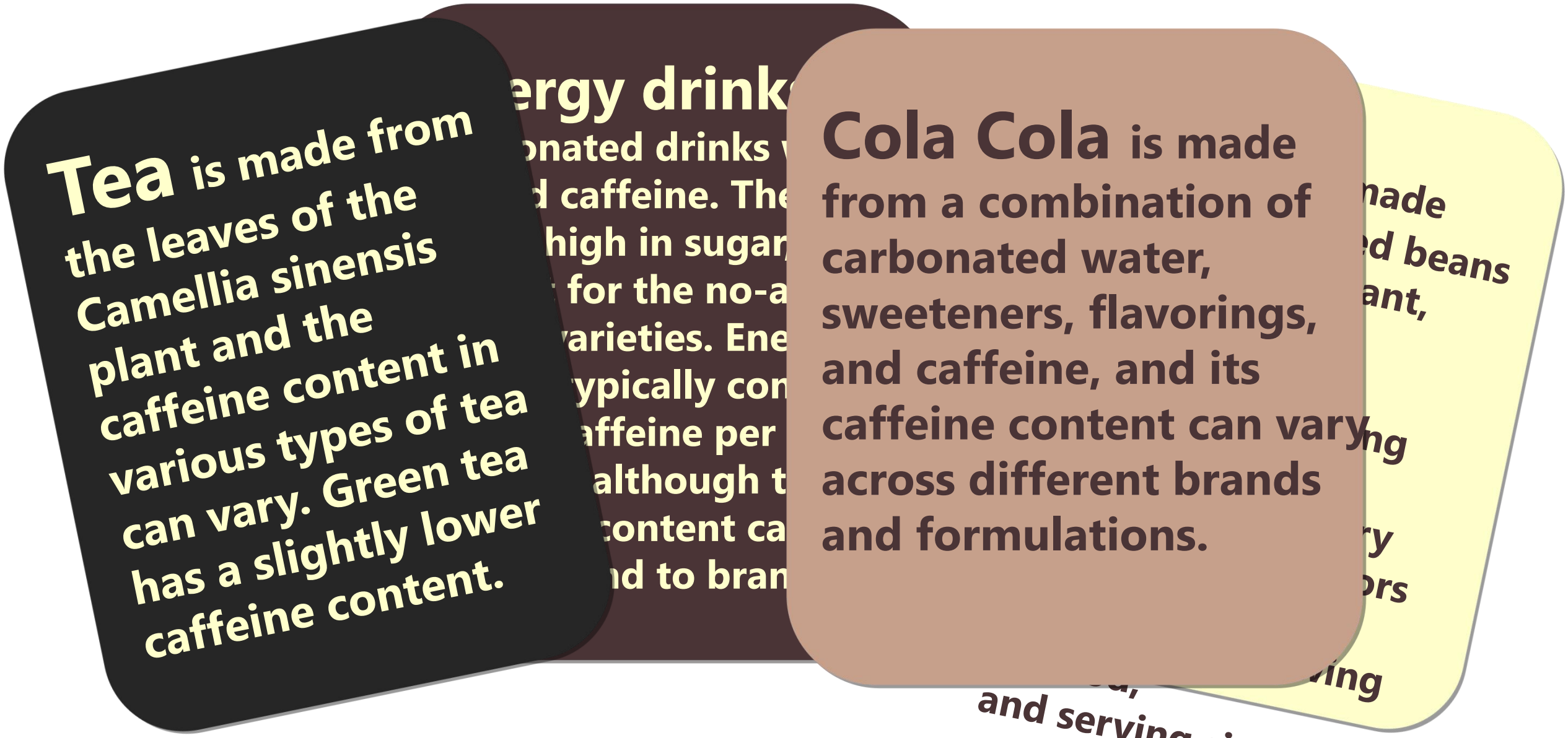

Presence of caffeine in different drinks and food

Tea is made from the leaves of the Camellia sinensis plant and the caffeine content in various types of tea can vary. Green tea has a slightly lower caffeine content.

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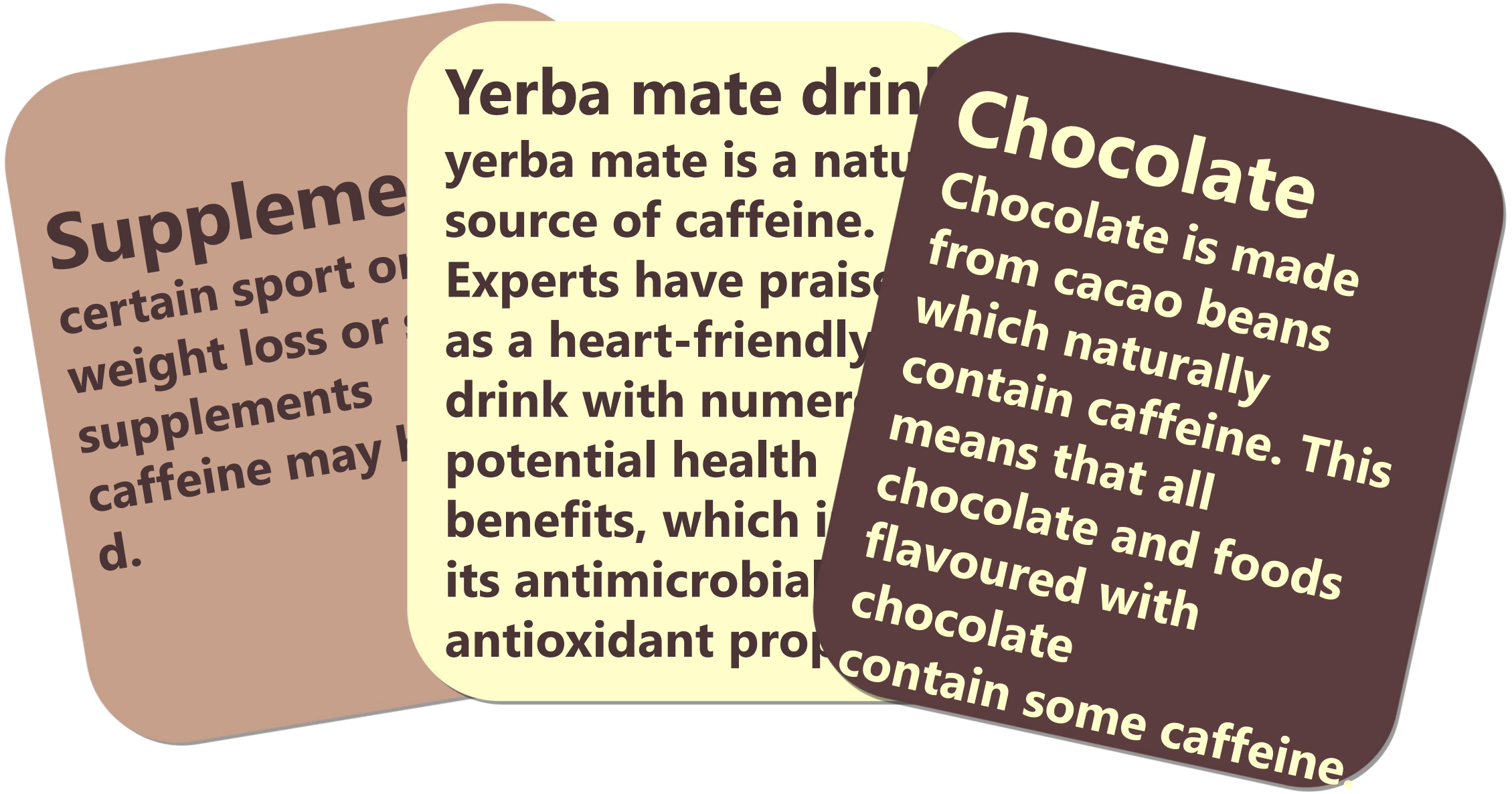
onated drinks with
d caffeine. They are
high in sugar,
for the no-added
varieties. Energy
ypically contain 80
affeine per 250 ml
although the
content can vary
nd to brand.

Coffee is made from the roasted beans of the Coffea plant, and the caffeine content can vary significantly among different types of coffee. this can vary depending on factors such as the type of coffee bean, brewing method, and serving size

Presence of caffeine in different drinks and food



Presence of caffeine in different drinks and food

Supplement In certain sport or weight loss or sports supplements caffeine may be added.

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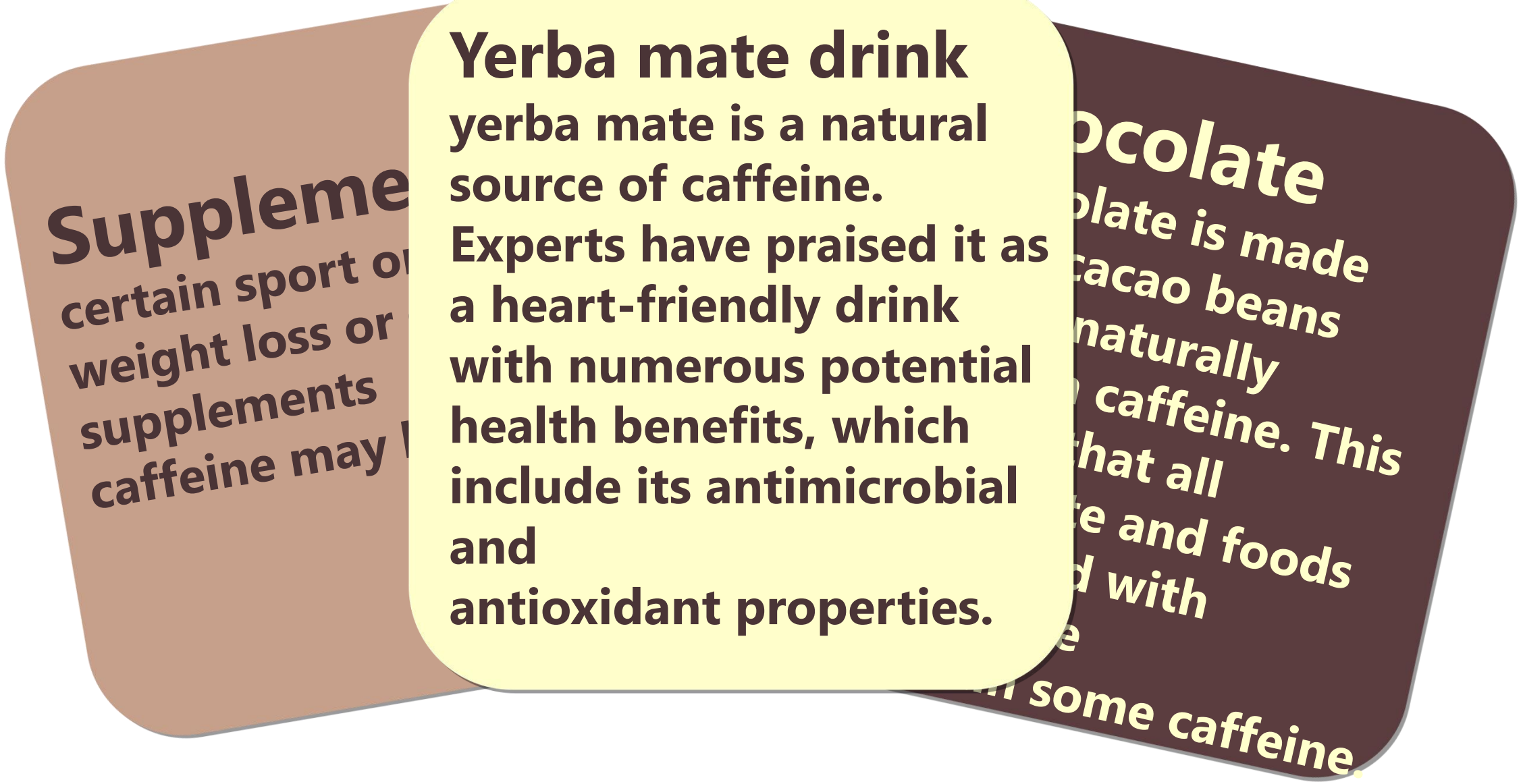
Chocolate
Chocolate is made from cacao beans which naturally contain caffeine. This means that all chocolate and foods flavoured with chocolate contain some caffeine.

Presence of caffeine in different drinks and food



Presence of caffeine in different drinks and food

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yerba mate is a na
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Experts have prais
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with numerous
potential health
benefits, which in
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Chocolate

Chocolate is made from cacao beans which naturally contain caffeine. This means that all chocolate and foods flavoured with chocolate contain some caffeine.

Presence of caffeine in different drinks and food


How much caffeine is in chocolate?

Concentration of caffeine in these products

Is 1. Tea: 15-70 mg per cup (240 ml)

2. Mate: 30-85 mg per cup (240 ml)

3. Coffee: 30-165 mg per cup (240 ml)

4. Cola: 30-55 mg per can (355 ml)

5. Cocoa & Hot Chocolate: 2-25 mg per cup (240 ml)6. Energy Drinks: 50-300 mg per can (250-500 ml)

7. Chocolates & Candy Bars: 1-80 mg per 100 grams

Concentration of caffeine in these products

1.Tea•“For tea, the caffeine content varies by type. Black tea typically contains between 40 and 70 milligrams per cup,mate tea also have its own range ,ranging from 30 to 85 milligrams per cup.”

2.Coffee

•“Coffee shows even more variation. A standard cup of brewed coffee can contain anywhere from 95 to 165 milligrams of caffeine. Instant coffee, on the other hand, tends to range between 30 and 90 milligrams per cup.

Concentration of caffeine in these products

3.Cola and Other Caffeinated Soft Drinks

- **“When it comes to soft drinks like cola, a typical can (around 355 ml) has roughly 30 to 50 milligrams of caffeine. Diet versions can be a bit higher, ranging from 35 to 55 milligrams.”**

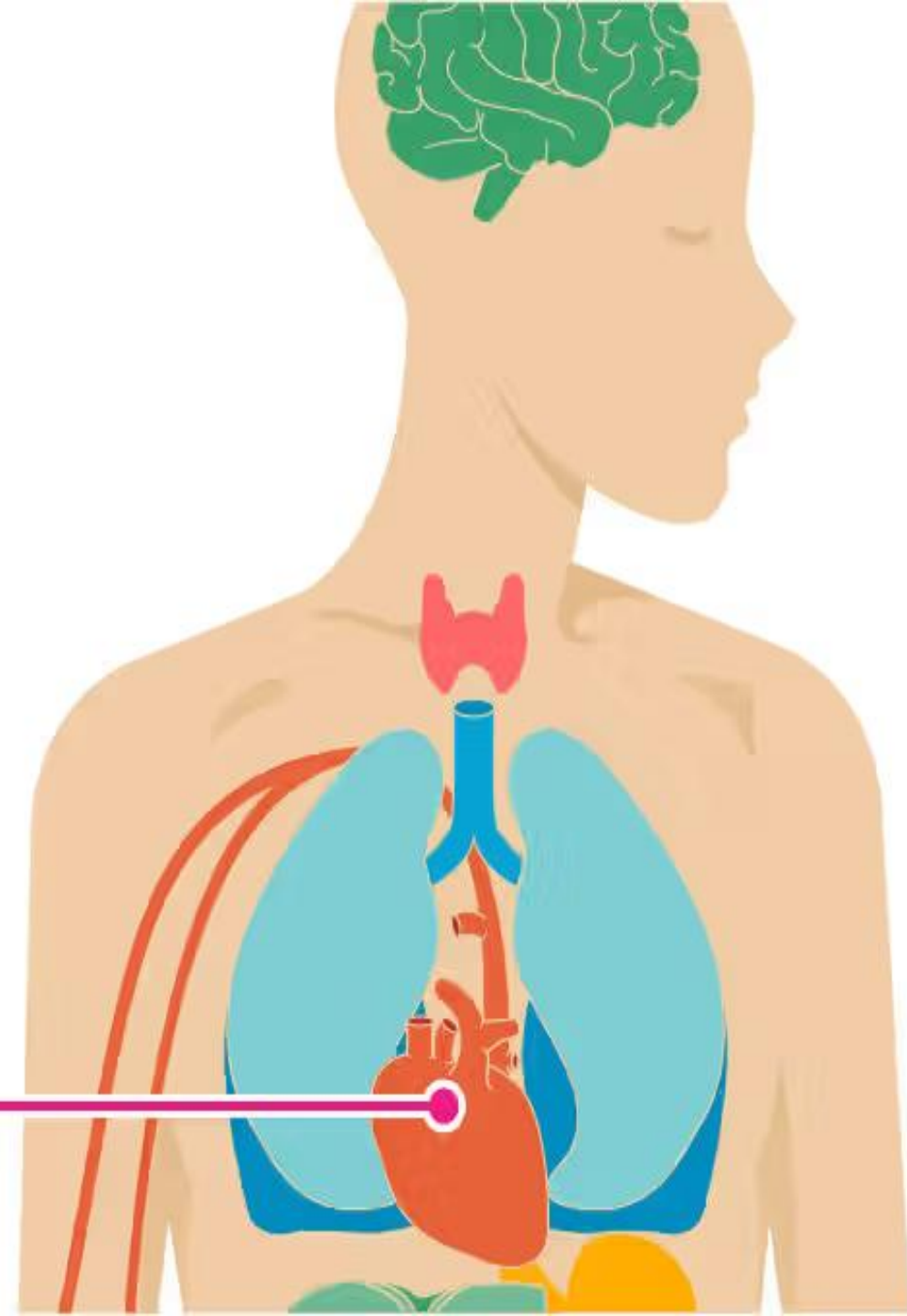
4.Additional Products

- **“Although the image mainly focuses on beverages, it also hints at other products like cocoa and chocolate. For example, hot cocoa generally contains about 5 to 10 milligrams per cup, while dark and milk chocolates have different caffeine levels depending on the cocoa content.”**

The Effects of

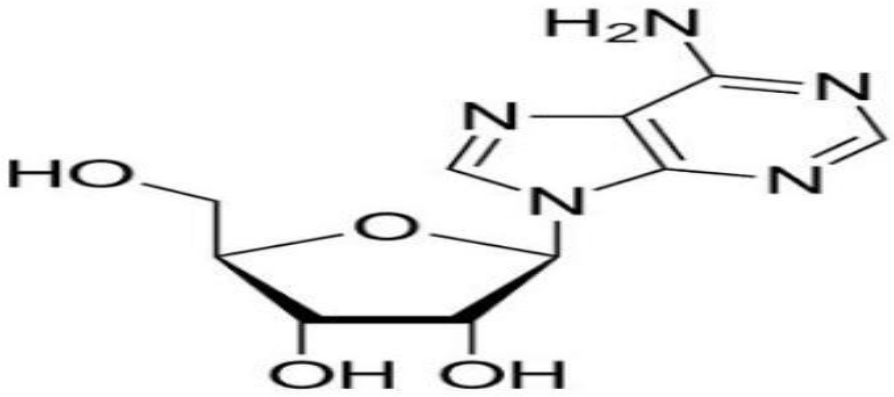
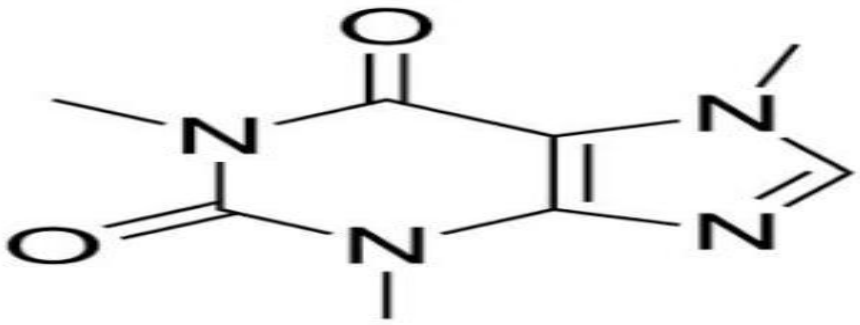
Caffeine

ON YOUR BODY



Pharmacological effect of caffiene

1-CNS stimulation by the antagonistic effect of the adenosine receptors

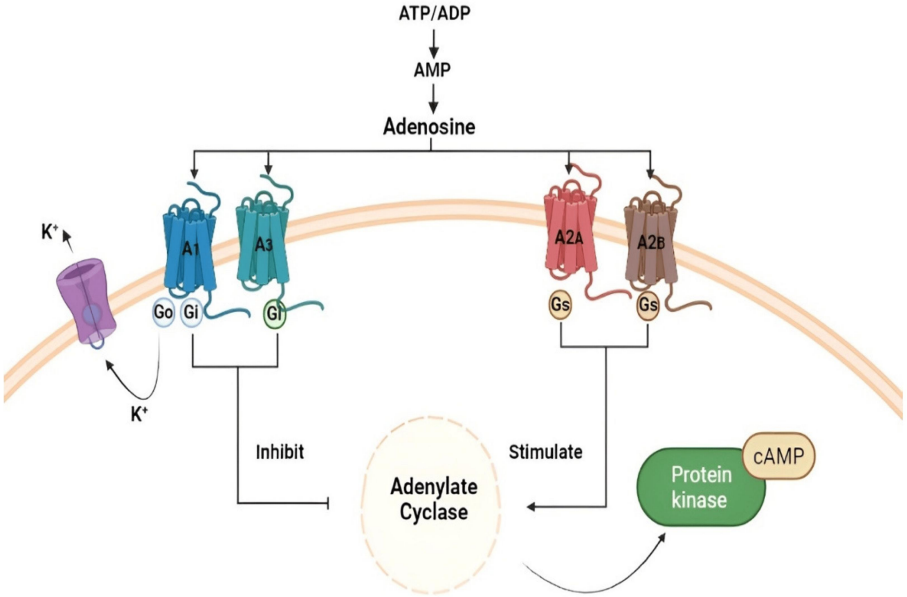
Adenosine	Caffiene
	
ADENOSINE	CAFFEINE
Ribose sugar is essential for activity.	Caffiene lacks ribose sugar, so it has an inhibition effect.

When adenosine binds to the A1 receptor:

- The A1 receptor is coupled with a Gi-type G protein, which inhibits the adenylate cyclase enzyme.
- As a result, the intracellular concentration of cAMP decreases.

This leads to:

- Inhibition of CNS activity (reduced release of neurotransmitters such as dopamine).
- A decrease in heart rate (a sedative effect on the heart).
- An increased feeling of sleepiness and fatigue.



When adenosine binds to the A2A receptor:

The A2A receptor is coupled with a Gs-type G protein, which activates the adenylate cyclase enzyme.

- As a result, it causes vasodilation and consequently lowers blood pressure.
- Inhibition of CNS activity (reduced release of neurotransmitters such as dopamine)occurs indirectly via the nigrostriatal pathway.

Caffeine prevents adenosine from binding to A1:

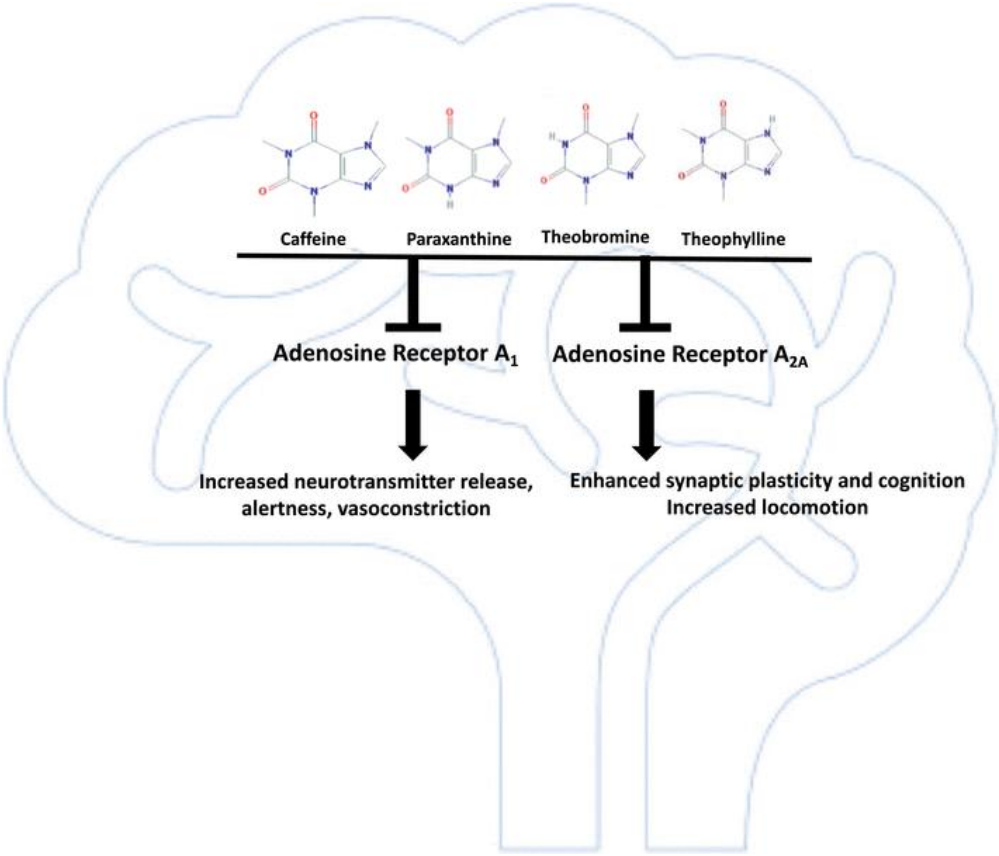
- The inhibition normally caused by adenosine is blocked, leading to an increase in cAMP within neuronal cells.

- This results in enhanced neuronal activity and the release of neurotransmitters such as dopamine and norepinephrine.
- The outcome: increased alertness and a slight rise in heart rate.

Caffeine prevents adenosine from binding to A2A:

- The increase in cAMP along this pathway is blocked, which prevents the inhibitory effect on dopamine.

- The outcome: Enhanced dopaminergic activity leads to improved mood, reduced feelings of fatigue, and stimulation of the nervous system.
- Reduced vasodilation, which may result in a slight increase in blood pressure



2.Increase Heart Rate and Blood Pressure

3.Effect on the Gastrointestinal System

•Caffeine stimulates the secretion of gastrin and increases the production of hydrochloric acid in the stomach, which may lead to inflammation and irritation of the mucosal lining.

4.Diuretic Effect

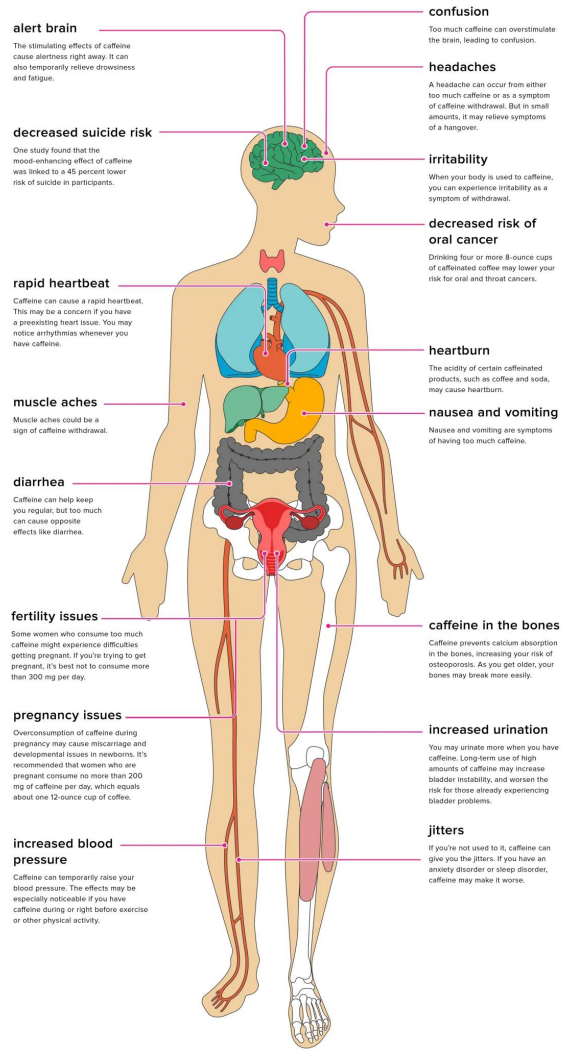
•Increased urination leads to the loss of fluids and electrolytes, such as potassium and magnesium.

•Mechanism: Inhibition of adenosine in the kidneys results in reduced sodium reabsorption and increased water excretion, thereby producing a diuretic effect

5. Effect on Bones and Growth

•Reduced calcium absorption has a negative impact on bone density.

Mechanism: The diuretic effect increases the loss of calcium in urine and, additionally, caffeine inhibits calcium absorption in the intestines.

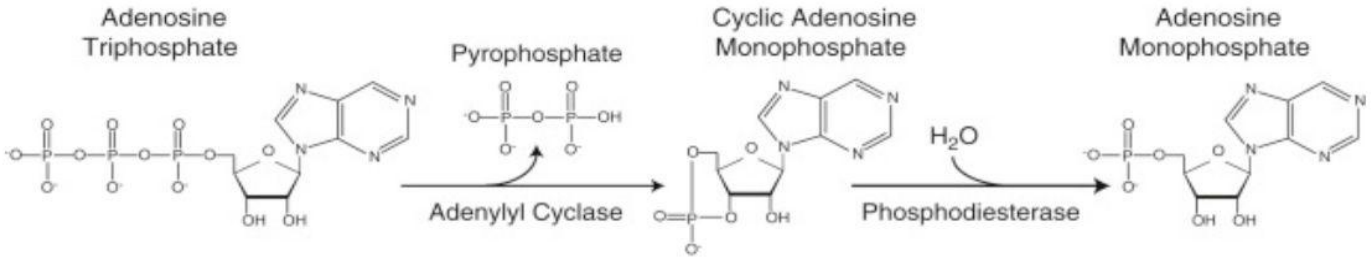


6) Bronchodilation (therapeutic effect)

•Caffeine belongs to the methylxanthine family, the same class as theophylline, a drug used to treat asthma and chronic lung diseases such as chronic obstructive pulmonary disease (COPD).
Mechanism of Action:Phosphodiesterase (PDE) Inhibition: This leads to increased levels of cyclic AMP (cAMP) within airway smooth muscle cells, causing muscle relaxation and bronchodilation.

7) Improvement of Respiratory Function in Neonates (Neonatal Apnea)

•In neonates, especially preterm infants, frequent episodes of breathing cessation (apnea of prematurity) can occur due to immature respiratory centers in the brain.
Mechanism of Action: Stimulation of CNS receptors, enhancing the brain's response to low carbon dioxide levels, thereby reducing apnea episodes



How Much Caffeine Is Too Much?

Recommended daily dose of caffeine

Recommended maximum daily intake Health scientists have reviewed several studies about caffeine and its potential health effects. Based on this review, we recommend maximum daily caffeine intakes depending on your age ,weight, overall health and circumstances.

- **For healthy adults: Up to 400 mg of caffeine per day is considered safe. This is roughly equivalent to 4 cups of brewed coffee, 10 cans of cola, or 2 energy drinks, depending on their caffeine content.**

- **For pregnant women: It is recommended to limit caffeine intake to 200 mg per day to reduce potential risks to the baby.**

- **Children under 12 years: Caffeine is not recommended, as it can interfere with growth, sleep, and heart rate**

If you're sensitive to caffeine, consider avoiding it or lowering your intake.
Excessive intake can lead to negative health effects

Beverage	Size	Caffine dose
Coffee	16 oz	140–240 mg
Espresso	1 shot	58–75 mg
Decaf Coffee	16 oz	<10 mg
Black Tea	12 oz	70–75 mg
Green Tea	8 oz	27–36 mg
Cola Beverages	12 oz	34–72 mg
Caffeine caplets	1 caplet	200 mg

- **improved mood and a lower risk of depression**
- **lower risk of stroke in some studies**
- **coffee may help protect against cancers of the mouth, throat and digestive system.**
- **Some potential health benefits associated with drinking coffee include protection against type 2 diabetes, liver disease, and liver cancer.It also increases the circulation of chemicals such as cortisol and adrenaline in the body. In small doses, caffeine can make you feel refreshed and focused.**

Recommended daily dose of caffeine

Caffeine Intolerance

* Much like lactose intolerance, the body lacks the appropriate enzyme to digest caffeine.
* The effects are felt almost immediately

Treatment?

Remove caffeine from your diet!


Can Caffeine
Overdose Kill You?
STARBUCKS
COFFEE
Adobe Spark

5- Side effects of Caffeine and overdose

Caffeine has both short-term and long-term effects, depending on" how much" and "how often" you consume it.

Short-Term Side Effects:

-Increased Heart Rate
-Insomnia
-Anxiety
-Digestive Issues
-Increased Urination : Acts as a diuretic
-Headaches : Can cause or relieve headaches, depending on tolerance.

Long-Term Side Effects:

-Dependence & Withdrawal : Regular use can lead to addiction
High Blood Pressure
-Bone Health Issues
-Increased Risk of Heart Issues
-Disrupted Sleep Cycle .

Who Should Be Careful ?

People with heart conditions, anxiety disorders, GERD (acid reflux), or high blood pressure and pregnant women “should monitor caffeine intake”.

IS COFFEE BAD FOR KIDS?

THE NOURISHED CHILD WITH Jill Castle

Caffeine and children

Caffeine can affect children differently than adults due to their lower body weight and increased sensitivity of their nervous systems.

effects of caffeine on children:

1- Increased activity and anxiety
May lead to hyperactivity, nervousness, and difficulty concentrating.
2- Sleep problems
Caffeine can stay in the body for hours, causing insomnia and sleep disturbances.
3-Digestive issues
May cause stomach upset or nausea.
4-Increased heart rate and blood pressure
Affects the cardiovascular system, especially at high doses.
5-Mild addiction and withdrawal symptoms .
Can lead to slight dependence, causing headaches and fatigue when discontinued.
6-Effect on calcium absorption
May impact bone density if consumed in large amounts.

The effect of caffeine on CNS stimulation is more noticeable in children than in adults, and this is due to :

A-Adenosine Receptors Maturation

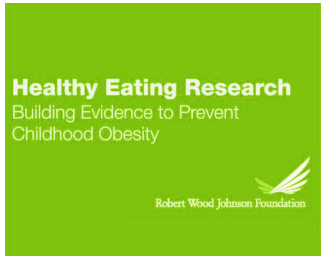
- **In children, the A1 and A2A receptors have not yet reached full maturity, meaning that the effect of caffeine as an antagonist to these receptors is stronger and lasts longer.**

B-Blood-Brain Barrier (BBB) Development

- **The blood-brain barrier in children is less efficient compared to adults, allowing higher concentrations of certain substances, such as caffeine, to pass into the brain and thereby increasing its stimulatory effect.**

C-.Incomplete Neurotransmitter Regulation

- **The regulation systems for dopamine, glutamate, and norepinephrine are still developing.**
- **Caffeine enhances the release of these neurotransmitters, which may lead to hyperactivity and anxiety, particularly because the brain is not yet capable of quickly achieving a balance among these substances**



Follow healthy eating research

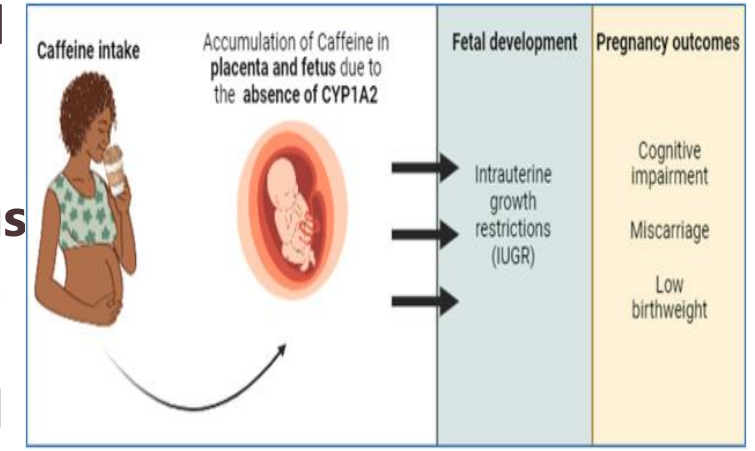
https://healthyeatingresearch.org/tips-for-families/ages-5-beverage-recommendations/


CONTRAINDICATION

Contraindications

1)patients with cardiovascular diseases
•Patients with uncontrolled hypertension.
•Patients with atrial fibrillation (AF) or supraventricular tachycardia (SVT).
•Patients with acute heart failure, as caffeine may increase cardiac workload.

2)pregnancy Maternally ingested caffeine can easily cross the placental barrier into the fetus where an equilibrium is reached between maternal and fetal plasma. However, both the placenta and the fetus is unable to metabolize caffeine. Caffeine cannot be metabolized by the human placenta because it only has CYP1A1 isozymes and lacks CYP1A2 isozymes. On the other hand, as the fetus lacks the liver enzymes required, it is unable to metabolize caffeine . These enzymes are only developed and present from the eighth month of pregnancy. Moreover, the caffeine clearance rate is slowed down in pregnant mothers due to a decrease in CYP1A2 enzyme activity.



3)Pediatrics & Neonates

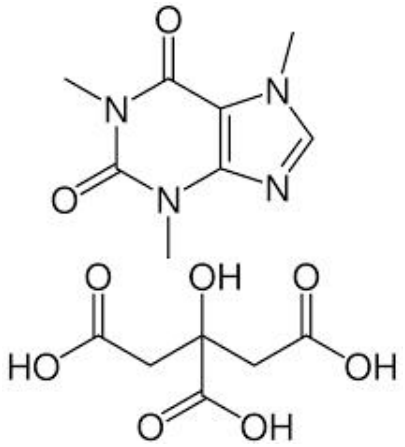
•Caffeine affects the development of the immature nervous system in children.

•It may cause hyperactivity and sleep disturbances.

•It increases calcium loss, which may impact bone growth.

only exception:

•In preterm infants, caffeine citrate is used to treat apnea of prematurity.



4)Patients with uncontrolled hyperthyroidism

Drugs with adverse effects when accompanied by caffeine consumption

- Alcohol
- Beta-blockers like propranolol
- MAOIs (Monoamine oxidases)
- Clozapine
- Benzodiazepines like diazepam
- Heart medications like verapamil
- Theophylline
- Levothyroxine
- Warfarin
- Adderall
- Birth control pills
- Fluvoxamine
- Medications metabolized by CYP1A2
- Ritalin
- Dextroamphetamine
- Phenylephrine
- Pseudoephedrine
- Ciprofloxacin
- Mexiletine
- Ondansetron
- NSAIDs like naproxen
- Fluoxetine

Coadministration and high caffeine consumption

Reduced caffeine, if required to be consumed in a gap with medication upon medical advice

Recommendations

1 - Moderate caffeine intake (around 200-400 mg per day, roughly 2-4 cups of coffee) is generally considered safe for most healthy adults.

2- It can enhance alertness, concentration, and physical performance.

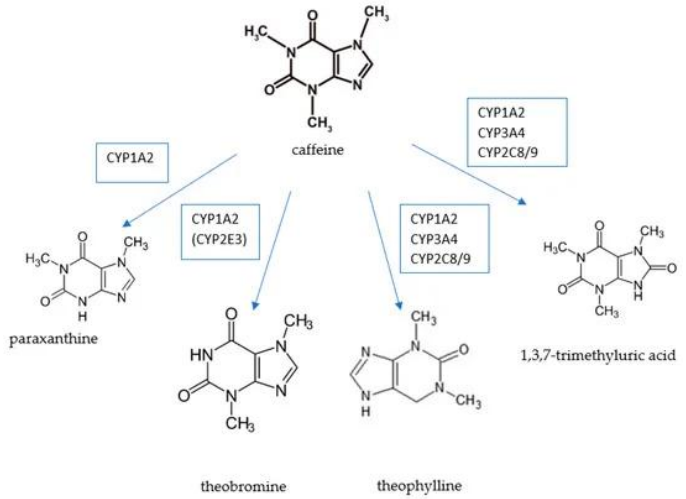
LIMIT CAFFEINE INTAKE

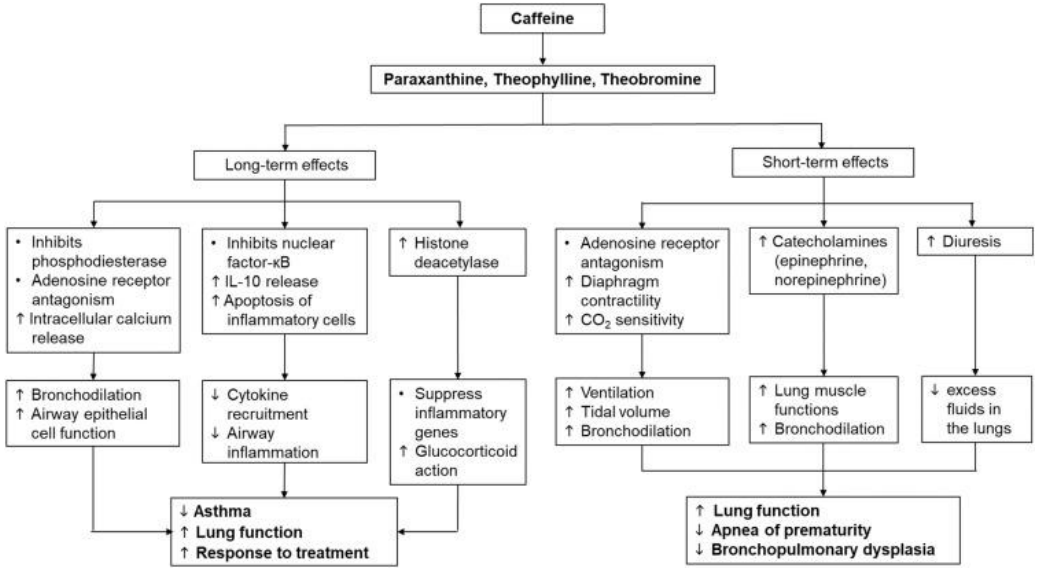
3- Caffeine should be consumed earlier in the day to avoid sleep disturbances.

4- Stay hydrated, as excessive caffeine can contribute to dehydration due to its mild diuretic effect.

5- Pregnant Women: Limit intake to ≤200 mg/day to reduce the risk of complications.

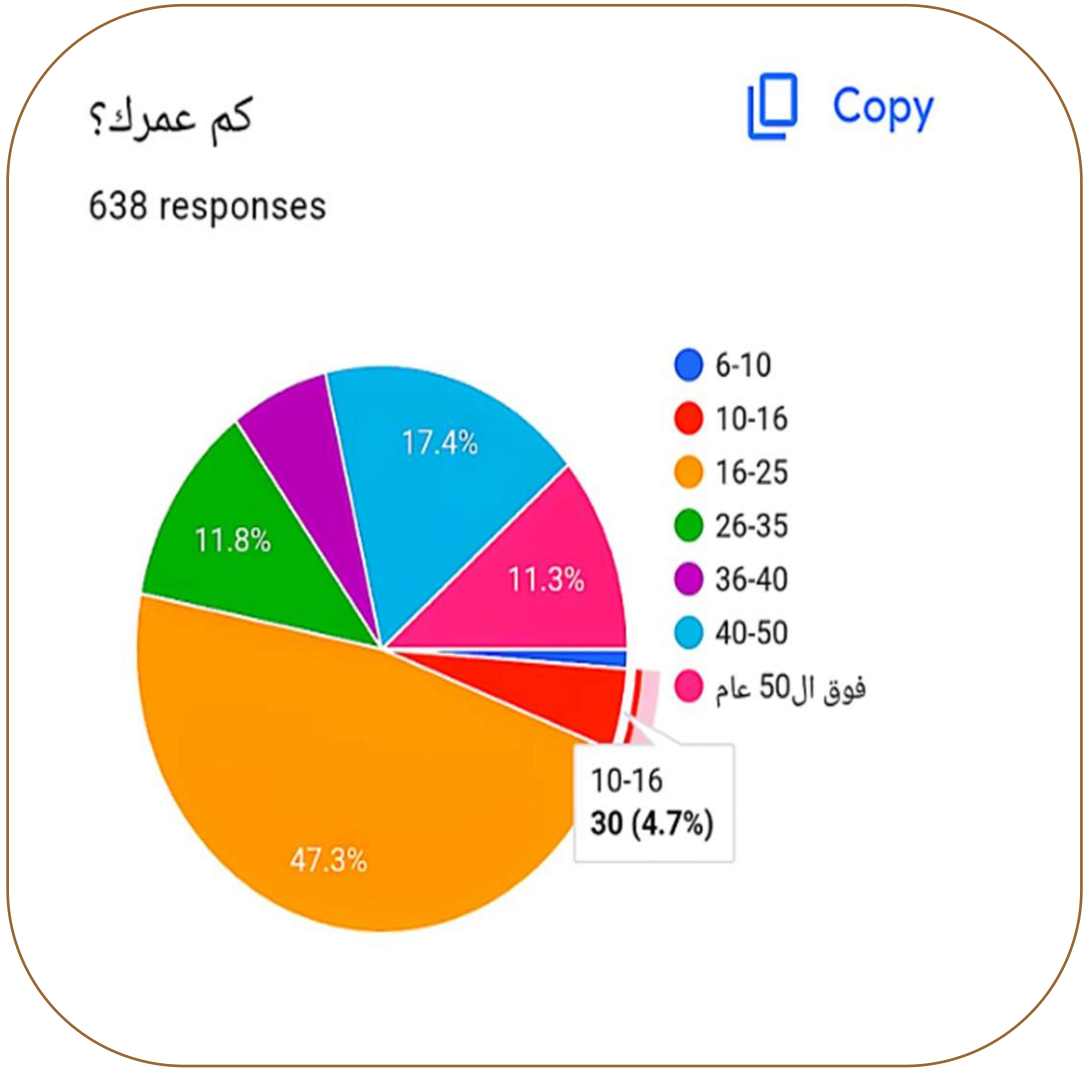
- **6- Children & Adolescents: Intake should be minimized or avoided due to potential effects on sleep, anxiety, and heart rate.**
- **7- People with Cardiovascular Conditions: High doses may cause palpitations and increased blood pressure.**
- **8- Individuals with Anxiety Disorders: Caffeine can worsen nervousness and jitteriness.**
- **9- Patients on Medications: Caffeine interacts with certain drugs (e.g., stimulants, theophylline, ciprofloxacin), so consult a healthcare provider if unsure. When to Avoid or Limit Caffeine.**
- **•Before bedtime (4-6 hours prior) to prevent insomnia**
- **.•If experiencing heartburn or acid reflux, as caffeine can increase stomach acid.**





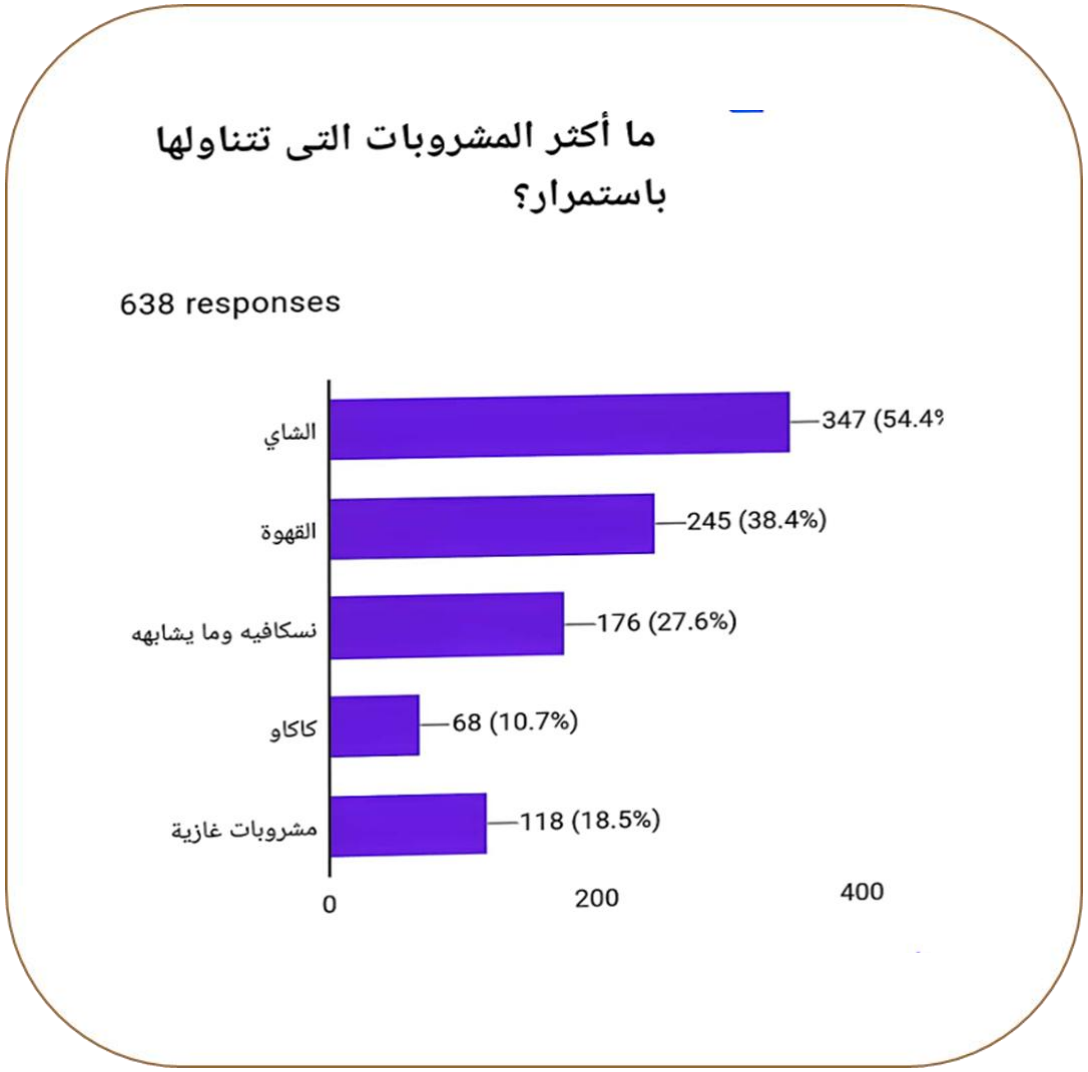

SURVEY
RESULTS

Results of survey on caffeine intake



Age Groups of Participants
(Total Participants 638)

- **16-25 years: 47.3% (Largest proportion of participants).**
- **6-10 years: 17.4%.**
- **26-35 years: 11.8%.**
- **10-16 years: 4.7%.**
- **36-40 years: 11.3%.**
- **40-50 years: A small percentage**
- **Above 50 years: A very small percentage.**

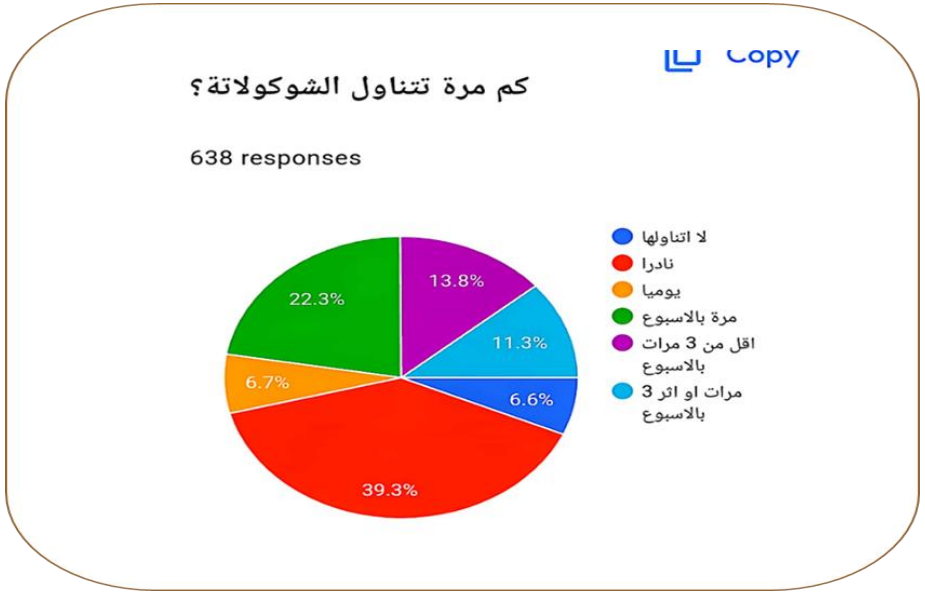


2-Gender Distribution

- **Females: 61.1%.**
- **Males: 38.9%.3.**

3-Most Regularly Consumed Beverages

- **Water: 54.4% (Highest percentage).**
- **Coffee: 38.4%.**
- **Chocolate-based drinks: 27.6%.**
- **Carbonated drinks: 18.5%.**
- **Cocoa: 10.7%.**



4. Energy Drink Consumption

- **No: 76.6% (The majority do not consume energy drinks)**
- **Yes: 23.4%.**

5. Preferred Time for Consuming Caffeinated Beverages

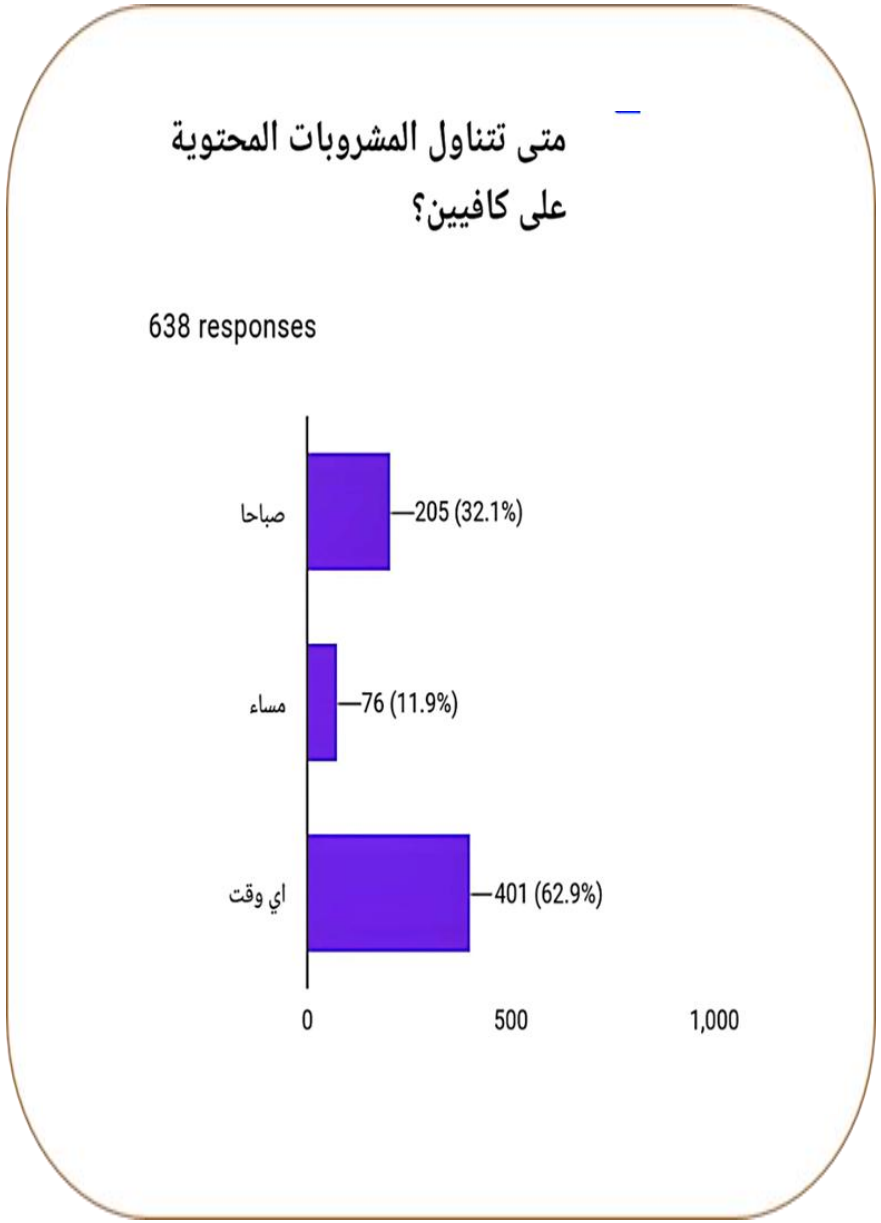
- **Anytime: 62.9% (Most participants do not have a specifi time).**
- **Morning: 32.1%.**
- **Evening: 11.9%.6.**

Preferred Time for Consuming Cocoa

- **Anytime: 60.5%.**
- **Evening: 34%.**
- **Morning: 7.4%.7.**

Frequency of Chocolate Consumption

- **Several times a week: 39.3% (Most common group).**
- **Less than three times a week: 22.3%.**
- **Once every three days: 11.3%.**
- **Rarely: 13.8%.**
- **Do not consume chocolate: 6.7%.**



8. Preferred Time for Consuming Chocolate

- **Anytime: 81%.**
- **Evening: 12.9%.**
- **Morning: 6.1%.9.**

Health Issues Among Participants

- **No health issues: 57.2% (Majority).**
- **Migraine or frequent headaches: 25.7%.**
- **High blood pressure: 13.2%.**
- **Diabetes: 8.3%.**
- **Low blood pressure: 6.1%.**

10. Giving Chocolate to Children

- **Yes: 69.7% (Most participants give chocolate to children).**
- **No: 30.3%.**

Key Findings:

- **The majority of survey participants are young adults (16-25 years), mostly females.**
- **Water is the most consumed beverage, followed by coffee, while energy drinks are not widely consumed.**
- **Most participants do not have a specific time for caffeine consumption.**
- **Chocolate is regularly consumed, and some participants experience health issues such as migraines or high blood pressure.**
- **A significant proportion gives chocolate to children, which may influence their caffeine consumption from an early age.**

Follow the guidelines of the General Authority for Health and Food.

اللجنة الوطنية للتغذية | National Nutrition Committee

الهيئة العامة للغذاء والدواء | Saudi Food & Drug Authority

https://www.sfda.gov.sa/sites/default/files/2022-01/SFDAProductsContainingCaffeine.pdf

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RESOURSES

National Library of Medicine (NIH), book title :Caffeine for the Sustainment of Mental Task Performance: Formulations for Military OperationsDrug bank ,caffeine article book title “Caffeine for the Sustainment of Mental Task Performance: Formulations for Military Operations.” NCBI (National Center for Biotechnology Information), National Library of Medicine (NIH).

https://www.sfda.gov.sa/sites/default/files/2022-01/SFDAProductsContainingCaffeine.pdf

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Thank
you