ARTIFICIAL SWEETENERS: WHO COMMITTEE'S STAND ON ASPARTAME AND ITS EFFECTS

GS III: Sci & Tech

Source: IE

Understanding Artificial Sweeteners:

- Low-calorie sweeteners (LCS) are sugar substitutes with fewer calories than regular sugar.
- They are also known as non-nutritive sweeteners, sugar substitutes, or high-intensity sweeteners.
- Found in various food and beverage products labeled "sugar-free" or "diet."

Name of LCS	Source
1. Sucralose	• Made from adding chlorine to sugar molecules.
2. Saccharin	• The oldest artificial sweetener. • Made from benzoic sulfonimine and is up to 700 times sweeter than table sugar.
3. Acesulfame	• Made from acesulfame potassium.
4. Aspartame	• Made from the amino acids phenylalanine and aspartic acid. Also includes methanol.
5. Neotame	• Similar to aspartame and made from phenylalanine and aspartic acid.
6. Stevia	• Extracted from the leaves of the stevia plant. • The extracts are processed before they're packaged and sold, putting them in the same category as an artificial sweetener.
7. Sugar alcohols	• Sugar molecules with an alcohol attached. Naturally occur in some fruits.

How the Body Reacts to Artificial Sweeteners:

- Regular sugar is processed by the body for energy or stored as glycogen or fat.
- Artificial sweeteners, being man-made chemicals, are not easily absorbed by the body.

Diet Colas: Key Points on Artificial Sweeteners and Health Risks

- **Zero-Calorie Claim**: Diet colas are promoted as calorie-free substitutes for regular colas, utilizing artificial sweeteners to achieve this claim.
- **Altered Taste Perception:** The high sweetness of artificial sweeteners can impact taste perception, causing regular sweets to be perceived as less sweet. This effect may trigger cravings for even more sugary foods.
- **Caution with Erythritol**: Special consideration should be given to erythritol, as it is associated with potential health risks, and it is advisable to avoid its consumption.

- Some sugar alcohols like xylitol or sorbitol can cause digestive issues.
- When absorbed, artificial sweeteners go to the liver for elimination, similar to how the liver processes alcohol.

Benefits of Artificial Sweeteners:

- Add sweetness without calories, making them appealing for weight management
- Useful in weight-loss diets to gradually reduce sugar consumption.
- Suitable for diabetics or pre-diabetics as they don't affect blood sugar levels.

Disadvantages and Side Effects:

- Some studies suggest a possible link between LCS and glucose intolerance by altering gut microbiome in mice.

- Artificial sweeteners may not satisfy sugar cravings, leading to overeating to fulfill the craving.

Recent News Summary:

- In May 2023, the World Health Organization (WHO) advised against using artificial sweeteners for weight loss and preventing lifestyle diseases.
- However, another committee concluded that the acceptable daily intake (ADI) for **aspartame** does **not need to be reduced**.
- Consuming a few aspartame tablets in beverages like coffee and tea is considered safe based on this analysis.

Key Findings from the WHO Report on Artificial Sweeteners:

- **Negative Impact on Weight Control**: WHO advises against using artificial sweeteners for weight control or reducing the risk of non-communicable diseases. While short-term use may lead to weight loss and lower BMI, long-term consumption is associated with weight gain.
- **Potential Health Risks:** Some studies indicate potential adverse effects of artificial sweeteners. There might be a link between artificial sweetener consumption and bladder cancer and preterm birth in pregnant women.
- **Increased Risk of Chronic Conditions**: Higher intake of artificial sweeteners, especially in beverages and added to foods, is linked to an elevated risk of type-2 diabetes, cardiovascular diseases (including stroke and hypertension), and preterm birth.

WHO Recommendations for Sugar Intake:

- **Explore Alternative Methods**: Instead of relying solely on non-sugar sweeteners, WHO suggests considering other approaches to reduce free sugar intake. This includes consuming naturally occurring sugars from fruits or choosing unsweetened food and beverages.

PRELIMS SPECIFIC NEWS:

DIABETES: It is a chronic condition that arises when
Pancreas fails to produce enough insulin or when the body fails to use the insulin that is produced adequately.

Diabetes type 1 is believed to be brought on by an unintentional autoimmune response in which the body fights itself. Body can't produce insulin as a result of this reaction.

DIABETES Type 2: In this condition, the body has trouble using insulin and cannot maintain normal blood sugar levels.

Gestational Diabetes: It appears in pregnant women who have never had diabetes.

Prediabetes: Blood sugar levels are elevated but not high enough to be diagnosed as type 2 diabetes.

Prelims

Q. Aspartame is an artificial sweetener sold in the market. It consists of amino acids and provides calories like other amino acids. Yet, it is used as a low-calorie sweetening agent in food items. What is the basis of this use? (2011)

(a) Aspartame is as sweet as table sugar, but unlike table sugar, it is not readily oxidized in human body due to lack of requisite enzymes.

(b) When aspartame is used in food processing, the sweet taste remains, but it becomes resistant to oxidation.

(c) Aspartame is as sweet as sugar, but after ingestion into the body, it is converted into metabolites that yield no calories.

(d) Aspartame is several times sweeter than table sugar, hence food items made with small quantities of aspartame yield fewer calories on oxidation.

Answer: (d)

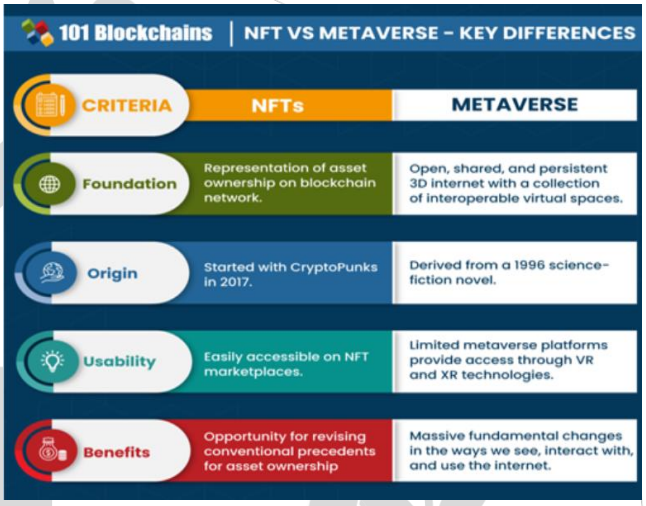
G20 CONFERENCE ON 'CRIME AND SECURITY IN THE AGE OF NFTS, AI, AND METAVERSE'

Understanding Metaverse and NFTs:

- **Metaverse**: A virtual shared space enabling realistic interaction between users and digital objects.
- **NFTs:** Digital assets representing unique items, like virtual real estate and collectibles, on a blockchain.

Need for the Conference on Crime and Security:

- Growing importance of cyber security in the digital era with economic and geopolitical implications.
- Emergence of new security challenges from 'dynamite to metaverse' and 'hawala to cryptocurrency.'
- Terrorists exploiting darknet, metaverse, and cryptocurrency for violence, radicalization, and financing.
- Metaverse enabling deep-fakes for identity theft and fraud.



Vulnerabilities of India and Other Countries:

- Major economies facing cyber-attack threats, estimated $5.2 trillion losses globally during 2019-23.
- Cybercrime trends like ransomware, phishing, online scams, and child sexual abuse expected to rise.
- **India** with 840 million online users and an additional 400 million expected by 2025, facing increased cyber threats.

DIFFERENCE BETWEEN DIGITAL AND CRYPTOCURRENCY

FEATURES	DIGITAL CURRENCY	CRYPTOCURRENCY
Regulation	By central authority(RBI)	Decentralised and regulated
Usage	Globally accepted currencies	Not widely accepted
Encryption	Needs strong passwords for protection.	Secured by Encryption.
Information	Only known to sender receiver and Bank	Publicly available on Decentralised ledger.

Way Ahead:

- Strengthening nations' and international organizations' capabilities to tackle emerging challenges like terrorism, terror financing, radicalization, and misinformation.
- Coordinated and cooperative approach for handling virtual assets effectively.

Conclusion:

- Technology has erased geographical and political boundaries, necessitating a focus on crime and security in the digital world.The G20's emphasis on digital transformation and data flow must now include measures to address cyber threats and ensure a secure digital environment.

INDIA-FRANCE RELATIONSHIP

GS II: IR Source: IE

Significance of the PM's visit to France:

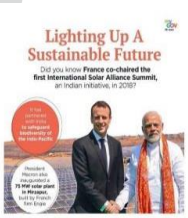
- **Increasing investment:** Diversifying economic ties away from China.
- **Boosting regional security**: Enhancing India's comprehensive national power and stabilizing the Asian balance of power.

Current analysis of India-France relations:

- **Characteristics**: Strategic autonomy, independent foreign policies, and a shared vision of a multipolar world.
- **Security objectives prominent**: Prioritizing security objectives over trade, with France helping India diversify arms suppliers beyond Russia and the US.
- **Balancing China**: Aiming to counter China's influence in the Indian Ocean and sharing concerns about Chinese expansionism.
- **Multi-dimensional partnership**: Advancements through joint strategic visions, logistic support agreements, and military exercises.

MILITARY EXERCISES BETWEEN INDIA AND FRANCE

1. VARUNA (NAVY)
2. GARUDA(AIR FORCE)
3. SHAKTI(ARMY)
4. DESERT KNIGHT(AIR FORCE)
5. Ex IMDEX (Navy)



- **Civil Nuclear Cooperation**: Inking a civil nuclear pact in 2008, with France's support in building nuclear power reactors and joint research and development.
- **Cooperation at International Forum:** Collaborating on global issues, supporting India's bids for UN Security Council and Nuclear Suppliers Group memberships, and joint initiatives like the International Solar Alliance.
- **Maritime Cooperation:** Ensuring a free, open, and inclusive Indo-Pacific region through partnerships and a Trilateral Development Cooperation Fund.
- **Space Cooperation**: Collaborating in space research, satellite technology, exploration, and planned joint missions.
- **Education and Cultural Exchanges**: Promoting educational and cultural exchanges, including mutual recognition of academic degrees.
- **Environmental Cooperation**: Strengthening collaboration on environmental issues, green hydrogen, blue economy, and environmental research.

Challenges in the relationship:

- **Lack of Free Trade Agreement**: Limiting potential for increased trade and economic cooperation.
- **Trade Imbalance**: France exporting more to India.
- **Differences on global issues**: Concerns expressed by France on India's stance at WTO, climate summit, and protection of intellectual property rights.

Conclusion:

Expanding beyond arms sales: Possibilities for broader cooperation, such as initiatives like the International Solar Alliance and multilateral efforts in the Indo-Pacific region.