SCIENCE CENTRE NEWS LETTER

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WHAT'S NEW IN SCIENCE?

Research on Twins Indicates that a Vegan Diet Improves Cardiovascular Health

In a study with 22 pairs of identical twins, Stanford Medicine researchers had found that a vegan diet improves cardiovascular (is refers health of heart) health eight weeks young. Although eating less meat improves Cardiovascular health, diet studies are often hampered by factors such as genetic differences, upbringing and lifestyle choices.

By studying identical twins, however, the researchers were able to control for genetics and limit the other factors, as the twins grew up in the same households and reported similar lifestyles. "This study provide a groundbreaking way to assert that a vegan diet is healthier than the conventional omnivore diet," said Christopher Gardner, Professor of Medicine at Stanford University.

Researchers selected healthy participants without cardiovascular disease from the Stanford Twin Registry - a database of fraternal and identical twins who have agreed to participate in research studies and matched one twin from each pair with either a vegan or omnivore diet. The vegan diet was entirely plant-based, included no meat or animal products such as eggs or milk. The omnivore diet included chicken, fish, eggs, cheese, dairy and other animal-sourced foods. During the first four weeks, a meal service delivered 21 meals per week – seven breakfasts, lunches and dinners. For the remaining four weeks, the participants prepared their own meals. The participants were asked about their dietary intake and kept a log of the food they ate.

"Our study used a generalizable diet that is accessible to any person, because 21 out of the 22 vegans followed through with the diet. This suggests that any person who chooses a vegan diet can improve their long-term health in two months, with the most change seen in the first month." The participants with a vegan diet had significantly lower low-density lipoprotein cholesterol (LDL-C) levels, insulin and body weight – all of which are associated with improved cardiovascular health – than the omnivore participants.

Courtesy - Lourds Convent High School

SCIENTIST OF THE MONTH

Adusumilli Srikrishna

Adusumilli Srikrishna was born on 1st January, 1955 at Gudivada, Andhra Pradesh. He did graduate studies at ANR (Akkineni Nagaswara Rao) College of Nagarjuna University, Andhra Pradesh in 1973 and completed a master's degree from Andhra University in 1975. Enrolling at University of Hydrabad under the guidance of Dr. Govardhan Mehta, he secured a M.Phil in synthetic Organic Chemistry in 1976 and a Ph.D in 1981. Moving to the U.S (United States) in 1982, he completed post doctoral studies at the Laboratory of Philip Eaton at University of Chicago in 1984. He returned to India in 1985 and joined the Indian Institute of Science, Bangalore, Karnataka as a teaching faculty at the Department of Organic Chemistry.

Srikrishnan focused his researches on Organic synthesis and his studies have widened the understanding of the synthesis of natural products especially radical cyclisation and annulations based strategies.

Srikrishnan received the Young Scientist Medal of the Indian National Science Academy in 1987. Indian Chemical Society awarded him the Professor R.D. Desai 80th Birthday commemoration award in 1996. The Council of Scientific and Industrial Research awarded Shanti Swarup Bhatnagar prize in 1997. He died on 20th January 2013 at the age of 58.

Courtesy - Lourds Convent High School

Timings
Tuesday to Sunday
& Public Holidays
9.30 am to 4.30 pm

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SCIENCE FACTS JANUARY 2024

1 January 1925	American astronomer Edwin Hubble announces the discovery of galaxy outside the Milky Way.
2 January 1822	German Physicist Rudolf Clausius (Who introduced the concept of entropy) was born.
4 January 1643	English mathematician and natural philosopher Sir Isaac Newton (established classical mechanics) was born.
4 January 1940	Welsh Physicist Brian Josephson (Co-winner of the 1973 Nobel Prize in Physics for his theoretical predictions of the Josephson effect) was born.
6 January 1838	Samuel Morse first successfully test the electrical telegraph.
7 January 1610	Galileo Galilei observes the four largest moons of Jupiter for the first time.
7 January 1941	English Chemist John E. Walker (Co-winner of the 1997 Nobel Prize in Chemistry for their elucidation of the enzymatic mechanism underlying the synthesis of adenosine triphosphate) was born.
8 January 1891	German Physicist Walther Bothe (Co-winner of the 1954 Nobel Prize in Physics in recognition of his development of the coincidence counting method in the study of cosmic radiation and the discoveries he made with it) was born.
9 January 1816	Sir Humphry Davy test the Davy lamp for miners at Hebburn Colliery.
10 January 1916	Swedish Biochemist Sune Bergstorm (Co-winner of the 1982 Nobel Prize in Physiology or Medicine for discoveries concerning prostaglandins and related substances) was born.
10 January 1938	American Physicist and radio astronomer Robert Woodrow Wilson (Co-winner of the 1978 Nobel Prize in Physics for their discovery of cosmic microwave background radiation) was born.
11 January 1787	William Herschel discovers Titania and Oberon, two moons of Uranus.
11 January 1924	French neuroendocrinologist Roger Guillemin (Co-winner of the 1977 Nobel Prize in Physiology Or Medicine for their discoveries concerning the peptide hormone production of the brain) was born.
12 January 1899	Swiss Chemist Paul Hermann Muller (Winner of the 1948 Nobel Prize in Physiology or Medicine for his 1939 discovery of insecticidal qualities and use of DDT in the control of vector diseases such as malaria and yellow fever) was born.
13 January 1864	German Physicist Wilhelm Wien (Winner of the 1911 Nobel Prize in Physics for his discoveries regarding the laws governing the radiation of heat) was born.
15 January 1895	Finnish Chemist Arttari Ilmari Virtanen (Winner of the 1945 Nobel Prize in Chemistry for his research and inventions in agricultural and nutrition chemistry, especially for his fodder preservation method) was born.
18 January 1896	The X-ray machine is exhibited for the first time.
20 January 1931	American Physicist David Lee (Co-winner of the 1996 Nobel Prize in Physics for their discovery of superfluidity in helium-3) was born.
21 January 1912	German born Biochemist Konrad Emil Bloch (Co-winner of the 1964 Nobel Prize in Physiology or Medicine for discoveries concerning the mechanism and regulation of the cholesterol and fatty acid metabolism) was born.
22 January 1908	Soviet Physicist Lev Landav (Winner of the1962 Nobel Prize in Physics for his pioneering theories for condensed matter, especially liquid helium) was born.
22 January 1936	American Chemist Alan J. Heeger (Co-winner of the 2000 Nobel Prize in Chemistry for their discovery and development of conductive polymers) was born.
23 January 1876	German Chemist Otto Diels (Co-winner of the 1950 Nobel Prize in Chemistry for their discovery and development of the diene synthesis) was born.
25 January 1627	Irish Chemist Robert Boyle (Known foe Boyle's law) was born.
30 January 1899	South African virologist Max Theiler (Winner of the 1951 Nobel Prize in Physiology or Medicine for developing vaccine against yellow fever) was born.

U. N. : United Nations
WHO -World Health Organization
UNESCO - United Nations Educational Scientific & Cultural Organization

Answers: 1) d, 2) c, 3) c, 4) b, 5) a, 6) d, 7) c

SCIENTIFIC QUESTION

Time

"Time is defined so that motion appears straightforward"- John Archibald Wheeler

From the past through the present and into future, time is the ongoing sequence of existence and events that appears to be irreversible. it is a component quality of various measurements used to order events, compare their durations or intervals and quantify rates of change of quantities rates of change of quantities in material reality or concious experience. Along with the three spatial dimensions, time is frequently referrerd to as a fourth dimension.

"What a clock reads" is the operational defination of time in Physics. With regard to events occuring in space and time, general relativity addresses the physical nature of time. The collision of the two particles, the explosion of a supernova, or the arrival of a rocket ship are examples of events. Four numbers can be assigned to each event to indicate its time and location – the event's coordinates. Nevertheless, the numerical values vary depending on the observer. As Michelson and Morley first demonstrated publicaly, distance and time are inextricably linked and the time it takes for light to travel a partcular distance is the same for all observers.

In both the International System of Units (SI) and International System of Quantities, time is one of the seven funbdamental physical quantities. By measuring the electronic transition frequency of Caesium atoms, the second is the SI base unit of time. Because time is used to define other quantities like velocity, defining time in terms of these other quantities would be circular. Observing a certain number of repetitions of one or other standard cyclical event (such as the passage of a free-swinging pendulum) constitutes one standard unit, such as the second, is an exremly useful operational definition of time for conducting advanced experiments as well as every day life. Typically, a location (or position in space) and time are noted when describing an event's observations.

Courtesy - Lourds Convent High School

KNOW THE EXHIBIT

Health in Space- Muscle Problem

Without regular use and exercise human's muscles in microgravity, weaken and deteriorate, a process called Atrophy. Prolonged expouser to weightlessness could cause Astronauts to lose more than 40 percent of their muscle strength even with regular exercise, researchers said. On a long voyage, a healthy 30-50 year old Astronaut could end up with the strength of an 80 year old.

Astrounauts experience up to a 20% less of muscle mass on spaceflights lasting 5 to 11 days. The loss of muscle mass corresponds to a loss of strength that can be potentially dangerous if an Astronaut must perform a strenuous emergency procedure on re-entry into the Earth's gravitational field. Even though muscle mass and strength can be regained once Astronauts have returned to Earth, mainataining muscle in space is a concern, especially for long-duration space missions. The only way to minimize muscle atrphy in space is through intensive exercise, particularly strength training exercise, combined with an adequate diet.

This exhibit is situated at "Entering Space Gallery" between Fun Science Gallery and Power of Play Gallery at the first floor of Science Centre.

SCIENCE PROJECT

Surat Municipal Corporation had organized 'Science Fair-2023' at Art Gallery, Science Centre Surat on 18th and 19th August, 2023 for the students of std. 8 to 12. Lourds Convent High School had participated their project on 'Grease in Ocean' under the sub theme of 'Safe and Sustainable City'.

The aim of the project is to clean oil spill caused by oil tank carrying ship. An oil spill is the realse of a liquid petroleum hydrocarbon or oil into the environment, espescially in the marine ecosystem due to human activity and it is a form of pollution. The term is usually given to marine oil spills, where oil is released into the Ocean or coastal waters, but spills may also occur on land. It often presents a hazard to marine life and environment.

Main causes of spills: Oil leaks from ships, wells, pipe lines and other carriers of the oil, accidents of tankers, refineries and drilling rigs, carelessness in proper storage, breaking or malfunctioning of equipments, natural disasters etc.

Effects of oil spill on marine life: Oil does not mix with water, it forms a thick layer on Ocean surface and because of it, the sunlight does not reach the Ocean animals and plants. When oil spreads in the Ocean, deteriorating the health of marine life.

Effects on coastal lines: Oil is very damaging to the whole ecosystem as it covers everything which is nearby the coastal lines like sand, animals, grass and soil, causing erosion as well as contamination, waves, water current, even winds move the oil onto the shore with the surf and tide.

Prevention: Oil tanker should be filled only upto 90%, so that chances of leakage will be reduced. Necessary checks according to proper guidelines by authorities should be done. Regular check-ups on board should be done to immediately recover any spills.

Cleaning process: • **Booms**: these are equipments that contain the oil at one place in case of an oil spill.• **Skimmers**: these are used to carefully lift of the oil contained by the boom. •**Absorbents**: these are used to absorb the oil that is spilled in the Ocean. • **Dispersal or burning**: dispersals are used to disintegrate the oil, whereas burning/ignition is done by burning the oil in the Ocean.

PMS (Preventive Maintenance System) is a ship that cleans the oil spills in a less amount of time and it cost effective. PMS has a motor and pumps which with the help of suction, collects the oil and water inside its tanks. Then it will take the water to the land and filters oil and water which is use them in different Industries.

Advantages: • Quick • Efficient • Cost effective • Reuse of resources • Eco-friendly (use of solar panels to minimize the fuels) • Safe and sustainable • Easy communication through radio and other signals.

QUIZ

1. A water tanker filled upto 2/3 of its height is moving with a uniform speed on a sudden application of breaks, the water in the tank would _____.
a) move backward b) move forward c) be unaffected d) rise upwards

2. An athlete does not come to rest immediately after crossing the winning line due to the _____.
a) Inertia of motion b) Inertia of rest c) Inertia of direction d) None of these

3. Earthquake produces which kind of sound before the main shock were begins?
a) Ultrasound b) Infrasound c) Audible sound d) None of these

4. Where can the switch be placed in the circuit?
a) Left side of the battery b) Right side of the battery c)can be placed anywhere in circuit d) None of these

5. The coil of wire contained in an electric heater is known as _____.
a) Component b) Element c) Circuit d) Spring

6. Which mark is necessary for electric appliances?
a) AGMARK b) ISI c) FICCI d) KSK

7. Period 2005-2015 is being celebrated as the International Decade for action on _____.
a) Water for life b) Education for all c) Global war d) Terrorism