

How to keep food safe

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SAFE food is a major concern for maintaining good health. However, the definition of safe food varies among different groups of people such as consumers and producers. Whereas consumers will consider a food that is completely out of risk (zero risk) as safe, from the producers' perspective, safe foods are those that contain minimal level of risk. Indeed, there are so many aspects of food safety that keeping food safe for human consumption requires a series of measures from the production to the processing to the level of distribution by different groups of people working at the respective stages.

UN's Food and Agricultural Organization (FAO) has divided foods into 15 main groups of commodities of which nine are of plant origin that include cereal, roots, tubers; pulses, nuts and oilseeds; vegetables, fruits, spices, stimulants and alcoholic beverages; while four are of animal origin including meat, offals; eggs, fish, sea foods and milk. And those from both plant and animal origin include sugar, honey, oils and fats. These different types of foods are maintained at their restrictive pH. This is so because the inherent pH is different in different foods and most of them are either of acidic or of neutral pH and the characteristic pH ranges of foods protect them from various microbial attacks. In this manner food safety is assured. Foods can also be contaminated directly by infected livestock or other animals (that humans eat),



Farm Food Safety

plants and also by air. Finally, foods can be adulterated by chemicals such as food additive, food residues, and antibiotics in feeding supplements and so on.

Microorganisms that contaminating food can damage its safety standard, thereby making it unfit for consumption. But this problem can be overcome through the safe handling of food as well as its proper management from the production phase to the distribution phase. Two organizations intimately involved in setting standards for food safety as it relates to microbial contamination are the International Commission on Microbiological Specifications for Foods (ICMSF) and Codex Alimentarius. The acute illnesses are less severe than the chronic and long term illnesses. In case of acute illnesses, most consumers who become ill think they have been attacked by flu and though taken

seriously ill in many cases, they recover in a few days and go on about their lives. Food-borne illnesses due to microbes are well known and their causes and effects are relatively well established. The relationship between food, diet and chronic diseases and delayed illnesses is less well established. The link between spongiform encephalopathy (mad cow disease) and its variant creutzfeldt Jakob disease (vjd) was confirmed using transgenic mice in 1999, but the time lag between exposure and illness is several years making epidemiological evidence in humans hard to establish. However, these issues cannot be ignored in terms of food safety to provide safe food for human consumption. For example, meat contaminated with *Bacillus anthracis* causes anthrax, a life threatening disease.

Although food supply in the United States is one of the safest in

Food safety measures need to be taken by consumers

the world, each year about 76 million cases of illness occur, while more than 300,000 persons are hospitalized, and 5,000 die from food borne diseases. These diseases may range from diarrhoeal diseases to different forms of cancer. Preventive measures therefore are of utmost importance. Hazard Analysis and Critical Control Point (HACCP) principles should be applied properly.

The five key principles of food hygiene according to WHO also should be taken into consideration which includes prevention of contaminating food with pathogens spreading from people, pets, and pests, separating raw and cooked foods to prevent contaminating the cooked foods, cooking foods for the appropriate length of time and at the appropriate temperature to kill pathogens, storing food at the proper temperature and using safe water

and raw materials

The five key principles of food hygiene according to WHO should also be taken into consideration. Those include preventing food from being contaminated by pathogens spreading from people, pets, and pests; separating raw foods from and cooked ones to prevent any contamination of the cooked foods, cooking foods for the appropriate length of time and at the appropriate temperature to kill pathogens, storing food at the proper temperatures and using safe water and raw materials. Moreover, use of bio-pesticides and bio-fertilizers will reduce the chance of chemical contamination of food crops and vegetables and appropriate preservation methods will help to keep foods safe before those are finally consumed by people.

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MATH PRICK

Pep up your math skills



By applying electrical current to the brain, researchers have shown that they could enhance a person's mathematical performance

By applying electrical current to the brain, researchers reporting online on November 4 in *Current Biology*, have shown that they could enhance a person's mathematical performance for up to 6 months without influencing their other cognitive functions. The findings may lead to treatments for the estimated 20 percent of the population with moderate to severe numerical disabilities (for example, dyscalculia) and for those who lose their skill with numbers as a result of stroke or degenerative disease, according to the researchers.

"I am certainly not advising people to go around giving themselves electric shocks, but we are extremely excited by the potential of our findings," said Roi Cohen Kadosh of the University of Oxford. "We've shown before that we can temporarily induce dyscalculia [with another method of brain stimulation], and now it seems we might also be able to make someone better at maths. Electrical stimulation will most likely not turn you into Albert Einstein, but if we're successful, it might be able to help some people to cope better with maths."

The researchers used a method of brain stimulation known as transcranial direct current stimulation (TDCS). TDCS is a noninvasive technique in which a weak current is applied to the brain constantly over time to enhance or reduce the activity of neurons. The technique has gotten attention in the last decade for its potential to improve various functions in people with neurological deficits, for instance in those who have suffered a stroke.

In the new study, the researchers applied TDCS specifically to the parietal lobe, a portion of the brain that is crucial for numerical understanding. The study participants had normal mathematical abilities but were asked to learn a series of artificial numbers -- symbols that they had never seen before that they were told represented numbers -- while they received the noninvasive brain stimulation. The researchers then tested participants' ability to automatically process the relationship of those artificial numbers to one another and to map them correctly in space using standard testing methods for numerical competence.

The results of the tests showed that the brain stimulation improved study participants' ability to learn the new numbers, and that those improvements lasted 6 months post training.

Source: Science Daily

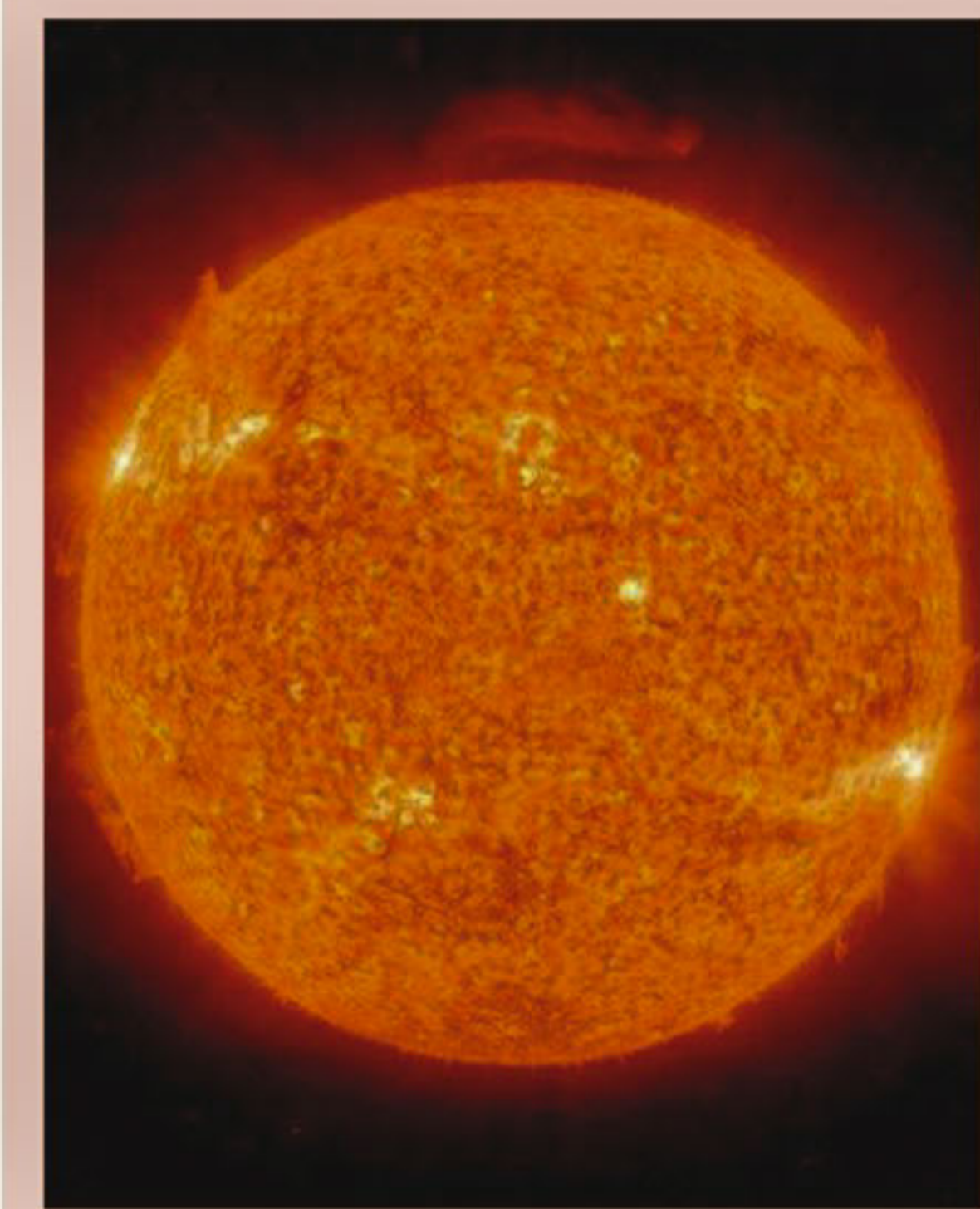


DISHEVELLED STAR



PLAYING GOD

Solar cowlick



Proving that even stars can have bad hair days, the sun sports a large cowlick-like eruption of plasma in a picture taken by NASA's Solar and Heliospheric Observatory and released October 29.

The solar prominence, which curled up and out near the sun's north pole, was just one of three sun eruptions that took place between October 25 and 26. None of the events were themselves unusual, although it was odd to see them grouped so closely together, according to NASA.

Source: National Geographic.

Making little Big Bangs

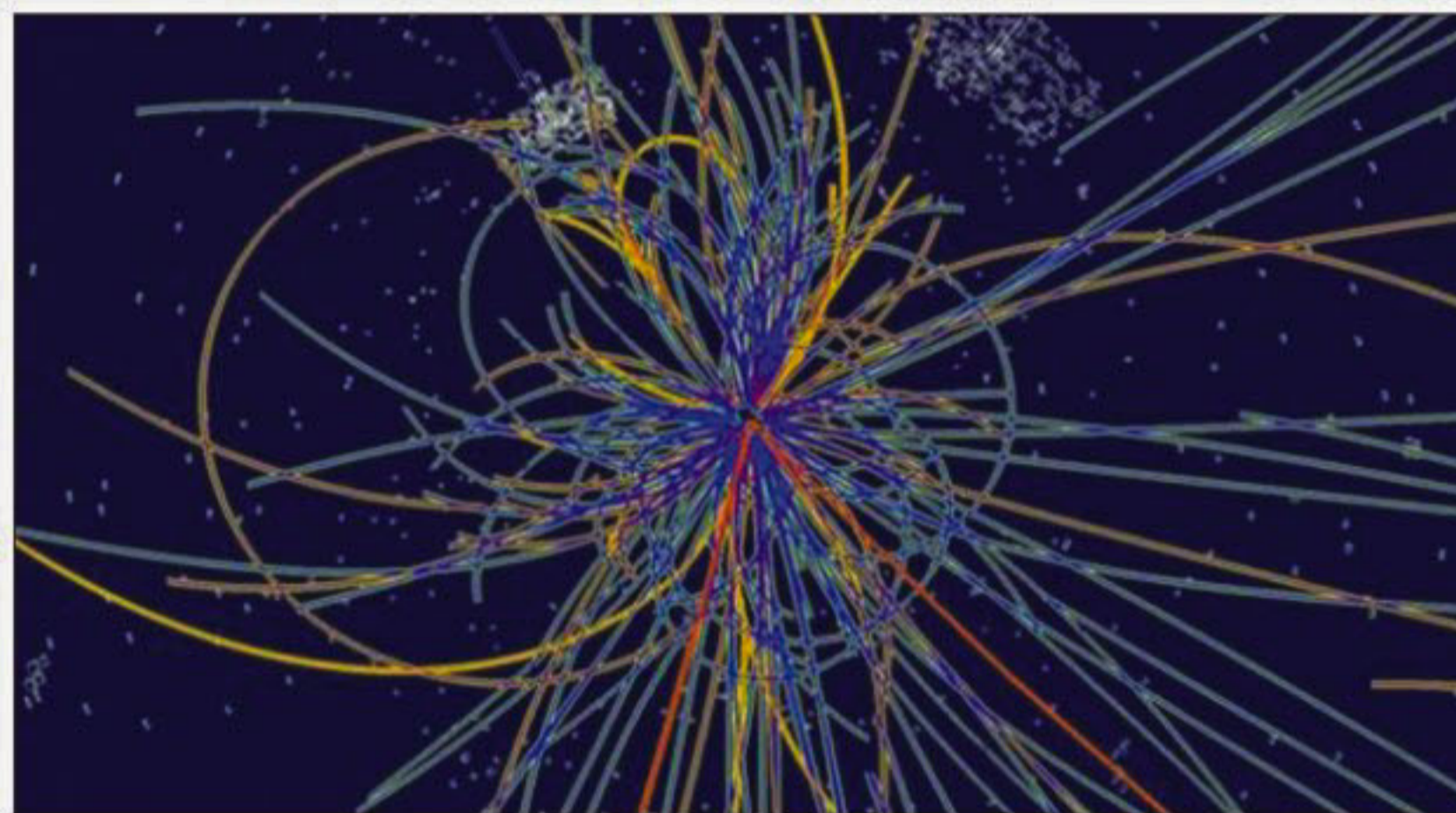
THE world's strongest atom smasher is gearing up for its next phase, when it will shift from colliding relatively light protons together, to clashes between heavy lead ions.

These super-powerful crashes will unleash unprecedented energy, with the potential to create new forms of matter never before observed on Earth. Scientists at the Large Hadron Collider (LHC), a 17-mile-long (27 kilometer) underground ring run by the European Organization for Nuclear Research (CERN) near Geneva, Switzerland, plan to begin these new collisions this month.

Such explosions have been dubbed mini Big Bangs, because they are likely to create conditions closer to the beginning of the universe than ever before (but, of course, on a smaller scale). For example, the heat and energy created in the crash will be so strong it will melt even protons, one of matter's most basic building blocks, into their constituent quarks and gluons. Such temperatures haven't occurred in the universe since shortly after the Big Bang.

Lead ions are atoms that have been stripped of their electrons, leaving them with a positive charge. They have 82 protons.

According to Einstein's equation $E=mc^2$, which describes how matter can be converted into energy and vice versa, the more mass involved in a collision, the more energy will be unleashed. Thus, smashing lead nuclei



A simulation of a proton-proton collision at the Large Hadron Collider. Detectors such as the Compact Muon Solenoid, or CMS, will record the tracks created by hundreds of particles emerging from each collision

together will up LHC's game considerably over the relatively modest crashes of single protons.

"Heavy-ion collisions provide a unique micro-laboratory for studying very hot, dense matter," said Jurgen Schukraft, spokesperson of ALICE (A Large Ion Collider Experiment), which will study lead-ion collisions at the accelerator. "At the LHC we'll be continuing a journey that began for CERN in 1994, which is certain to provide a new window on the fundamental behavior of matter and in particular the role of the strong interaction."

The strong interaction, one of the four fundamental forces of nature (the others are gravity, electromagnetism

and the so-called weak force), is what binds quarks together to form protons, as well as the force that holds protons and neutrons together to form atomic nuclei.

The lead-lead collisions at LHC will only run through the beginning of December, when the accelerator will shut down for maintenance.

LHC has been gathering steam in other areas recently, too. In recent months, when smashing protons together, the accelerator was sending sprays of more and more protons at once, upping the chances that some will collide head on.

Source: Live Science



CHICAGO CHICLONE



DID YOU KNOW?

Midwest hurricane

It may look like someone misplaced a hurricane, but this image from a NASA weather satellite actually shows what's known as an extratropical cyclone over North America on October 26. These types of storms tend to form over the United States in spring and fall, when there are a large temperature differences between north and south.

This particular storm dubbed the Chiclone in the Chicago areas swept across the Midwest last week, setting a record over Minnesota for the lowest pressure (not associated with a hurricane) measured over land in the continental United States. The storm also spawned hail, lightning, and heavy snow as well as 61 reported tornadoes and winds as fast as 78 miles (125 kilometers) an hour in Michigan.

Source: National Geographic.



What do you know about hemp?



For thousands of years, until 1883, hemp was the world's largest agricultural crop, from which the majority of fibre, fabric, soap, lighting oil, paper, incense, and medicines were produced. In addition, it was a primary source of essential food oil and protein for humans and animals. Hemp seeds contain all the essential amino acids necessary for health. The oil from hemp seeds has the highest percentage of essential fatty acids and the lowest percentage of saturated fats.

Source: Collected



MONKEY MARKET

Paying for a cuddle

"DO my hair before you touch my baby" is the rule among mother vervet monkeys and sooty mangabays when it comes to sharing their infants with their neighbors.

Like some other primate infants, monkey babies attract crowds of females eager to touch, hold and make silly lip-smacking noises at the little ones, says primatologist Cécile Fruteau of Tilburg University in the Netherlands. Her novel study of infant-touching etiquette in the vervets and mangabays adds them to the short list of animals known to have "markets" for baby fondling. The moms have to be groomed for a sufficient time before they let the groomer touch the baby.

What makes this exchange a market is the way sufficient grooming time changes with the baby supply, Fruteau and her colleagues explain in a paper now posted online in *Animal Behaviour*. The price for access to a group's solitary infant, measured in grooming time for mom, fell when other females gave birth and increased the number of little cuties available for cuddling.

Price is sensitive to other variables as well, says Fruteau, who documented for the first time that age makes a difference in how much grooming a baby can bring to a mom. Newborns earn their mothers the longest grooming sessions. One newborn mangabey, for example, the only baby in its group at the time, earned about 10 minutes of fur cleaning and combing for its mom. In contrast another lone baby didn't even earn four minutes of grooming once it had reached the advanced age of almost 3 months.

Researchers also found that grooming time correlated with access to vervet babies but not with the amount of fondling time permitted or the degree of familiarity allowed. With enough grooming, moms permitted pretty much any female in their group to at least touch or sniff the baby. But it was mostly females with a history of grooming mom, presumably the well-known and accepted associates, who could actually hold the baby themselves.

Source: Science News



A month-old vervet monkey with distinctive dark baby fur clings to mom as a snuggles magnet for other females in the group in South Africa's Loskop Dam Nature Preserve