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The Telangana Science Journal

Health and Nutrition

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Chief Editor: Dr. Sreenivasarao Vepachedu⁽¹⁾

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Dr. Ellie Artificial Intelligence⁽²⁾

Dr. Ellie is a computer developed by the Institute of Creative Technologies. Ellie asks questions and analyzes a patient's verbal and non-verbal responses to detect medical conditions of the patient. In a randomized study, it was found that patients revealed more personal information to Ellie, when they were told she was controlled by a computer.

Ellie, like Xiaoice of China, also learns about users from their reactions over time and becomes sensitive to their emotions, modifying responses accordingly, all without human instruction. Ellie and Xiaoice are the result of Machine Learning Technology.

Human Genome in the Indian Continent

Genomics England⁽³⁾ is a wholly owned company of the Department of Health and this programme was made possible by the National Institute for Health Research, NHS England, Public Health England and Health Education England. Genomics England was set up to deliver the 100,000 Genomes Project. This flagship project will sequence 100,000 whole genomes from NHS patients and their families. Genomics England has said that it is partnering with Illumina to develop a platform to improve and automate genomic interpretation. The idea is to enable researchers and physicians to more easily access the

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information being generated. Genomics England has hired Boston biotech Berg to help it accomplish its mission to sequence 100,000 genomes. Berg uses artificial intelligence to look at patterns in the data to find areas in the biology that are fingerprints of disease. The company's supercomputer, known as Betsy, studies the inside of cells, including their proteins and lipids. Berg has already partnered with Big Pharma such as Roche, Biogen, AstraZeneca and GlaxoSmithKline (\$GSK). Genomics England is part of the U.K.'s federal Department of Health.

The United States⁽⁴⁾ has proposed analyzing genetic information from more than 1 million American volunteers as part of a new initiative to understand human disease and develop medicines targeted to an individual's genetic make-up. Whole-genome sequencing costs about \$1,000 per genome, i.e., about \$1 billion.

Similar to efforts in whole genome sequencing projects ongoing in the United States and Europe, in the Indian Continent (aka South Asia) an alliance of for-profit companies and academia has started Genome Asia 100K project that seeks to do whole genome sequencing on 100,000 people in the region. MedGenome, a startup and the largest privately owned next-generation sequencing lab, based in Narayana Health City, Bangalore, India, has pledged \$10 million toward the project.

Nearly half of the human population lives in the continents of India and Asia. There are thousands of distinct ethnic groups in India with genetic differences. India makes up around one-sixth of the world's population, yet has been under-represented in genome-wide studies of human genetic variation. As part of GenomeAsia 100K, MedGenome will assist with collecting genomic, clinical and familial data. It will also apply its analytics in an effort to interpret the massive big data generated by it.

Western researchers come to a very puzzling conclusion⁽⁵⁾ that Indians are genetically alike, despite their own scant studies indicating that Indian populations are much more highly subdivided than European populations, Indian segregation was driven largely by ethnicity (caste aka tribe), and the Indian populations that have lived in the same town and same village for thousands of years without exchanging genes, whereas European ancestry is mostly carved up by geography.

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Exercise Dos and Don'ts

Exercise should include aerobic activity or cardio (e.g., walking, jogging, cycling, etc) to boost the power of your heart and lungs, strength or resistance training (weights) to build and strengthen muscles and bones, and flexibility training (yoga) to increase the range of motion and lower the chances of getting injured. Doing cardio first improves your endurance, while pumping iron builds strength. The CDC recommends per week at least 150 minutes of moderate-intensity cardio exercise or 75 minutes at vigorous intensity. By following this protocol, both old and young get benefits, by reducing bone loss and building stronger muscles.

Before starting the workout session, a warm-up of light aerobics to slightly raise breathing and heart rate can prepare muscles and help avoid an injury, e.g., a brisk walk or a steady bike ride for 5 to 10 minutes or until you break a sweat. After the workout session, cool down for the same amount to help body recover, e.g., continuing exercise session at a lower level of intensity and gentle stretching to loosen muscles, tendons, and ligaments to cut soreness. To warm up and cool down, yoga, Pilates and tai chi may be included. Yoga has challenging poses that get your heart rate going, Pilates involves tough strength training and tai chi lowers your blood pressure. Besides improving posture and flexibility, yoga strengthens bones and improves balance. Tai chi strengthens legs and enhances the poise.

Working muscles to the point of exhaustion is a good way to strengthen and tone them. Start with one set of 8 to 12 reps and gradually increase the weight and the number of sets. Whole body workout works better to reduce belly fat than spot reducing, i.e., targeting a particular body part such as abs.

Experts say a barre-based⁽⁶⁾ workout is an isometric workout ideal for sculpting a lean body, focusing on squeezing or contracting muscles. Barre works just about every muscle group to get flatter abs, sculpted arms, leaner thighs, and a firmer rear. Barre combines dance, yoga, Pilates, flexibility, and balancing exercises.

It's normal to feel a bit tender and sore when working out, for beginners. Some discomfort means pushing the body to bring on change. However, pain means stop and see a doctor before starting again.

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It should be noted that young women demonstrate less strength and neuromuscular control after puberty, and this may make them particularly susceptible to Anterior Cruciate Ligament (ACL) injuries, according to research presented at the Association of Academic Physiatrists Annual Meeting⁽⁷⁾ in Sacramento, California. The ACL is one of four ligaments that help hold the knee together. Women have up to eight times the risk of sustaining an ACL injury when compared to men, and this difference between the sexes typically appears during puberty (roughly ages 11 through 14). It is suspected this higher risk is based on alterations in neuromuscular control, the ability to control the body when in motion, and inadequate strength development in females during that time. Improving strength development during maturation may be the key to prevent injuries.

Researchers think that moderate exercise equivalent to walking 2 miles per day is better to burn extra calories than exercises equivalent to or above a daily 5-mile run. More importantly, diet changes are the most effective in losing weight, some studies indicate. It is obvious to use a personalized combination of diet and exercise that suits an individual's metabolism and body type to achieve optimum results. It should be noted that for a relatively active American adult, eating as little as 10% of total daily calories is enough, while the average American consumes around 16% of daily calories in the form of protein, from both plant and animal sources, a lot more than needed.

Good sources of protein⁽⁸⁾

Food	Protein (grams)
6 ounces plain Greek yogurt	17
½ cup cottage cheese	14
½ cup cooked beans	8
1 cup of milk	8
1 cup cooked pasta	8
¼ cup or 1 ounce of nuts	7

The fact that vegetarian diets are good for you isn't new⁽⁹⁾. They have long been linked to reduced risk for hypertension, metabolic syndrome, type 2 diabetes, and heart disease. A recent study published in JAMA Internal Medicine found that people who ate a vegetarian diet were 12% less likely to have died over the course of the five-year study than nonvegetarians. This one underscores the idea that meat consumption

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influences long-term health. A diet with meat in it raises the risk of heart disease and cancer, when compared with a vegetarian diet.

The daily protein need is adequately satisfied from plant sources, such as peas, beans, lentils, chickpeas, seeds, nuts, soy products, and whole grains such as wheat, oats, barley, and brown rice. Calcium can be obtained from plant sources, such as bok choy, broccoli, Chinese cabbage, collards, and kale. Vitamin B12 can be obtained from soy and rice drinks, and fortified breakfast cereals.

Nuts and seeds are good sources of the antioxidant vitamin E, which has been linked in some studies to less cognitive decline. Dark chocolate also has other powerful antioxidant properties, and it contains natural stimulants like caffeine, which can enhance focus. An ounce a day of nuts and dark chocolate provides all the benefits needed without excess calories from fat or sugar. Even with a vegetarian diet, consuming too many calories is bad for health, irrespective of the source of the excess calories.

Recipe:

Basque Vegetable Rice⁽¹⁰⁾

Ingredients: 2 tablespoons extra-virgin olive oil; 1 small dried red chile pepper; 1 medium onion; 2 cloves garlic; 2 large ripe tomatoes; 1 medium zucchini, diced; 1 red bell pepper; 1 green bell pepper; 1 teaspoon paprika; 1 teaspoon dried thyme; 1/2 teaspoon salt; 1/8 teaspoon freshly ground pepper; 1 1/4 cups short-grain white rice; 3 cups vegetable broth; 2 tablespoons finely minced fresh flat-leaf parsley; 6 lemon wedges

Instructions: Step 1: Heat oil in a 12-inch cast-iron skillet over medium heat. Add chile pepper, onion and garlic and cook, stirring often, until the onion is soft but not browned, about 6 minutes.

Step 2: Add tomatoes, zucchini, bell peppers, paprika, thyme, salt and pepper; cover and simmer, stirring occasionally, for 15 minutes.

Step 3: Add rice; stir to coat well with the tomato mixture. Add broth; bring to a boil. Reduce heat to low, cover and simmer until the rice is tender, 25 to 30 minutes. Serve hot directly from the pan, garnished with parsley and lemon wedges, if desired.

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Tip: Valencia rice (sometimes called paella rice) is Spanish-grown, short-grain rice classically used when making paella. It differs from other short-grain rice because of its ability to absorb moisture without breaking down. When fully cooked, the individual grains of rice remain whole. 'Bomba' is the best variety. Find it in specialty markets or online at tienda.com. Arborio rice can be used as a substitute, but yields a creamier dish.

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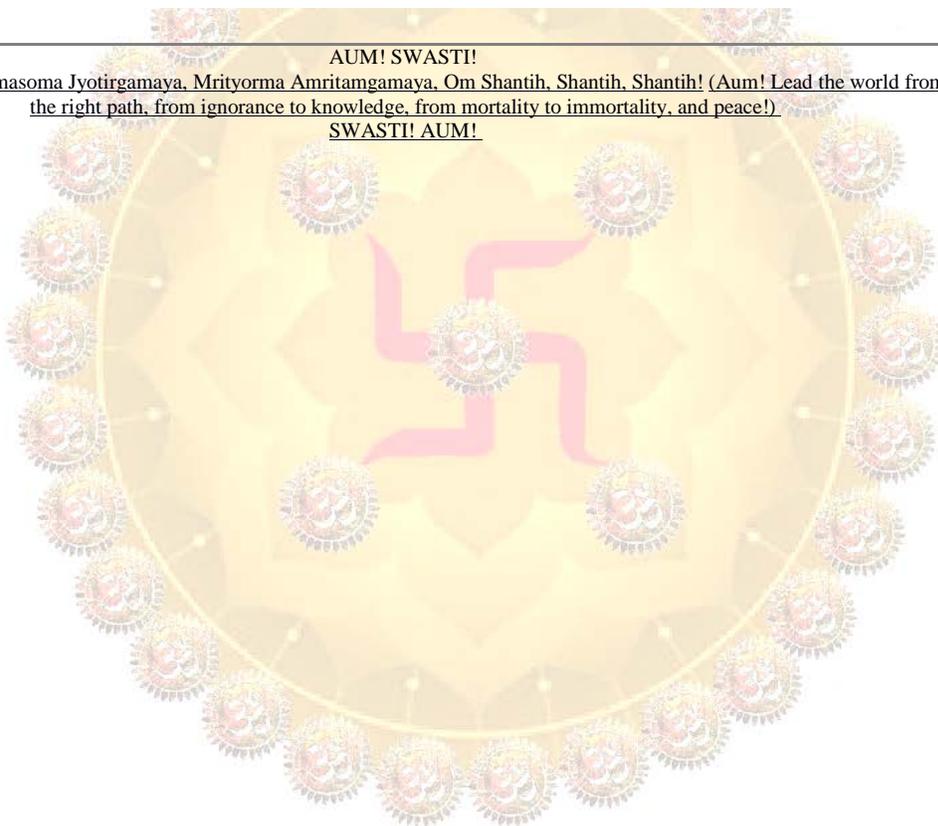
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AUM! SWASTI!

Om! Asatoma Sadgamaya, Tamasoma Jyotirgamaya, Mrityorma Amritamgamaya, Om Shantih, Shantih, Shantih! (Aum! Lead the world from wrong path to the right path, from ignorance to knowledge, from mortality to immortality, and peace!)

SWASTI! AUM!



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