BIO FANZINE

Exploring the Wonders of Life Sciences

The Science of Healthy Eating

Strategies for Optimal Health

NUTRITION: FUEL FOR A HEALTHY FUTURE

Dietary Choices for Well-Being

BIOMUSKETEERS CLUB

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ACADEMIC YEAR- 2025-26

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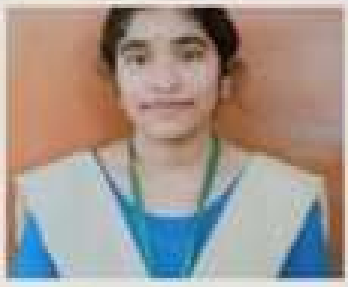

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EDITOR SPEAKS

A balanced diet is one that provides all the essential nutrients—carbohydrates, proteins, fats, vitamins, minerals, and water—in adequate proportions. No single food contains all the nutrients in the required amounts, which is why variety in food choices is essential. Cereals, pulses, fruits, vegetables, milk, eggs, and meat, when consumed in the right balance, support growth, provide energy, strengthen immunity, and maintain overall health. Nutritional biochemistry explains how these nutrients are digested, absorbed, and utilized, making it clear why deficiencies or excesses can have serious health consequences.

One of the most concerning outcomes of poor dietary intake is **Protein-Energy Malnutrition (PEM)**. It commonly affects children and vulnerable populations, leading to stunted growth, weakened immunity, and increased susceptibility to infections. Conditions such as marasmus and kwashiorkor are unambiguous cues of what happens when the body does not receive sufficient protein and energy. Beyond childhood, inadequate nutrition also contributes to chronic diseases such as diabetes, cardiovascular disease, osteoporosis, and certain cancers. Thus, understanding the science of nutrition is not only about avoiding deficiencies but also about preventing long-term health risks.

This magazine emphasizes that a good diet is not synonymous with expensive or exotic foods. Instead, it is about making wise choices with locally available, seasonal, and wholesome foods. Incorporating fruits and vegetables for vitamins and fiber, pulses and legumes for proteins, whole grains for energy, and adequate hydration are simple yet powerful steps towards better health. Moderation, balance, and variety remain the guiding principles of sound nutrition.

Through the collection of essays in this edition, readers will gain insights into the biochemical basis of nutrition and its direct impact on physical and mental well-being. By spreading awareness, *Biofanzine* aims to encourage healthier food habits, prevent malnutrition, and inspire individuals to view nutrition as the foundation of a disease-free, productive life.

Dr P. Mary Anupama

CONTENTS

HOW TO EAT FOOD PROPERLY: ADDRESSING ANTINUTRIENTS FOR BETTER HEALTH

Introduction

Food being a source of nourishment and energy is also a complex mixture of nutrients and non-nutrients. While nutrients such as proteins, carbohydrates, fats, vitamins, and minerals are essential for life, food also contains certain natural compounds called **antinutrients**. These substances interfere with digestion, absorption, or utilization of nutrients, and if not properly managed, may lead to health issues. Eating food properly, therefore, requires awareness of antinutrients, their health effects, and the strategies available to reduce them before consumption.

Common Antinutrients and Their Effects

Antinutrients are widely present in plant-based foods such as cereals, legumes, pulses, vegetables, and fruits. Some of the most important antinutrients, their dietary sources, harmful effects, and mitigation methods are summarized in the table below:

Antinutrient	Major Sources	Possible Side Effects	Mitigation Methods
Protease inhibitors	Legumes, soybeans	Reduced protein digestion, poor growth	Cooking, soaking
Phytic acid	Whole grains, legumes, seeds	Reduced absorption of iron, zinc, calcium, magnesium	Soaking, sprouting, fermentation
Oxalates	Spinach, rhubarb, nuts	Calcium oxalate kidney stones, reduced calcium availability	Boiling, blanching, calcium-rich diet
Goitrogens	Cabbage, cauliflower, broccoli	Thyroid dysfunction, goiter in iodine-deficient people	Cooking, adequate iodine intake
Tannins	Tea, sorghum, legumes	Reduced protein digestibility, iron absorption	Soaking, fermentation, cooking
Cyanogenic glycosides	Cassava, lima beans	Release of toxic cyanide, risk of poisoning	Soaking, fermentation, prolonged boiling

Antinutrients are commonly found in plant-based foods such as cereals, legumes, pulses, vegetables, and some fruits. For example, protease inhibitors, present in legumes and soybeans, interfere with protein digestion by inhibiting the activity of digestive enzymes like trypsin and chymotrypsin. Phytic acid, abundantly found

in whole grains, seeds, and legumes, chelates essential minerals such as iron, zinc, calcium, and magnesium, reducing their bioavailability. Similarly, oxalates, present in spinach, rhubarb, and nuts, form insoluble complexes with calcium and may contribute to kidney stone formation. Goitrogens, present in cruciferous vegetables like cabbage and cauliflower, interfere with iodine metabolism and can impair thyroid function if consumed in excess. Other examples include tannins in tea and sorghum, which reduce protein digestibility, and cyanogenic glycosides in cassava, which release toxic hydrogen cyanide upon hydrolysis.

The side effects of consuming food without proper preparation or mitigation of antinutrients can be significant. Reduced protein digestibility can lead to growth retardation and poor muscle maintenance, particularly in populations dependent on legumes as a primary protein source. Mineral deficiencies such as iron-deficiency anemia, zinc deficiency leading to impaired immunity, and calcium deficiency contributing to bone demineralization are often linked with high intakes of phytic acid and oxalates. Goitrogens may increase the risk of goiter and hypothyroidism in iodine-deficient regions. Excessive intake of cyanogenic glycosides without proper detoxification can lead to acute poisoning, neurological disorders, or chronic conditions like konzo, a paralytic disease. These health issues highlight why food must not only be chosen wisely but also prepared properly.

Health Implications of Consuming Antinutrients

If foods containing high levels of antinutrients are consumed without proper preparation, they may lead to several health concerns. Reduced protein digestibility caused by protease inhibitors can impair growth and muscle maintenance, especially in populations depending heavily on legumes. Phytic acid and oxalates may bind essential minerals, leading to deficiencies such as anemia, weak bones, or impaired immunity. Goitrogens, when consumed excessively, can cause thyroid enlargement and hypothyroidism in iodine-deficient regions. Cyanogenic glycosides in poorly processed cassava can even cause acute poisoning or chronic neurological disorders. These examples highlight the importance of proper preparation before consumption.

Traditional and Scientific Mitigation Strategies

Fortunately, both traditional and modern scientific approaches effectively reduce antinutrients in foods:

- **Soaking** grains and legumes leaches out soluble compounds like tannins and phytates.
- **Germination or sprouting** activates phytase, an enzyme that breaks down phytic acid, improving mineral availability.
- **Fermentation** (e.g., idli, dosa, bread, and pickles) reduces phytates, tannins, and cyanogenic compounds while enriching the food with probiotics.
- **Cooking methods** such as boiling, roasting, and steaming denature protease inhibitors and lectins, while

boiling cassava reduces cyanide content.

- **Blanching and peeling** vegetables lower oxalates and goitrogens.

These methods, practiced in Indian households for centuries, not only enhance safety but also improve the digestibility and nutritional value of foods. For instance, soaking dals overnight before cooking, fermenting idli batter, and boiling spinach before preparation are practical examples of how traditional food preparation minimizes the harmful effects of antinutrients.

Conclusion

Eating food properly is not just about choosing nutritious items but also about how they are prepared. Antinutrients, though naturally occurring, can compromise nutrient absorption and lead to health issues if neglected. By adopting practices such as soaking, sprouting, fermenting, and cooking, we can effectively minimize their harmful effects. Thus, proper food preparation ensures that our diets deliver maximum nourishment and safeguard long-term health.

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INVESTIGATIONS OF SUGAR INDUSTRY INFLUENCE

Abstract

For decades, people believed that dietary fat and cholesterol were the main culprits behind heart disease and obesity. However, later research revealed that sugar also plays a serious role in these health problems. Investigations carried out in recent years have uncovered how the sugar industry shaped scientific research and public opinion in the 20th century. These findings are important because they show how industries can influence health policies, food habits, and even scientific knowledge.

Early Years of Sugar Research

In the mid-20th century, heart disease was rising sharply in countries like the United States. Scientists were trying to understand why. Some studies suggested that saturated fats and cholesterol were dangerous, while others pointed towards sugar as a possible cause.

In 1972, British scientist John Yudkin published a book titled Pure, White and Deadly, where he argued that sugar consumption was linked to heart disease, diabetes, and obesity. However, his warnings were not taken seriously. At the same time, American scientist Ancel Keys strongly promoted the idea that fat was the main danger. The focus of nutrition guidelines shifted almost completely toward reducing fat, leaving sugar in the background.

Sugar Industry's Role in Shaping Science

Recent historical investigations have shown that the Sugar Research Foundation (SRF), an industry group, played a major role in influencing research during the 1950s and 1960s.

In 1967, the SRF secretly funded researchers at Harvard University to publish a review in the New England Journal of Medicine.

This review downplayed the risks of sugar and instead highlighted fat and cholesterol as the key drivers of heart disease.

At that time, journals did not require disclosure of funding sources, so the public never knew the research was industry-funded.

By directing scientific focus away from sugar, the industry successfully protected its interests. For decades, the message to the public was clear: avoid fatty foods, but sugar was not considered a major problem.

Consequences of Industry Influence

This shift had long-lasting effects:

1. Public Health Guidelines

Governments and health organizations recommended low-fat diets. Food companies responded by producing "low-fat" processed foods, but these were often loaded with sugar to improve taste.

2. Rising Sugar Consumption

Since people were not warned about the dangers of sugar, consumption increased. Sugary drinks, cereals, and snacks became part of daily diets.

3. Health Outcomes

Over time, obesity, type 2 diabetes, and heart disease rates rose dramatically. Today, scientists agree that added sugars—especially in beverages—are a major risk factor for these conditions.

Modern Investigations

In 2016, researchers at the University of California published a paper using old documents from the Sugar Research Foundation. These papers clearly showed that the industry had paid scientists to emphasize fat and minimize sugar's role in heart disease.

Another set of documents showed how the sugar industry even influenced dental research. Instead of studying ways to reduce sugar consumption, many industry-funded studies focused on other methods, like developing toothpaste or mouth rinses, to fight tooth decay.

These investigations confirmed what many suspected: industry funding can create biased results and delay important health warnings.

Lessons for Today

The story of sugar industry influence teaches us several important lessons:

Transparency in Research: Today, journals require researchers to disclose funding sources to prevent hidden influence.

Critical Thinking: People should understand that not all studies are completely neutral. Financial interests may affect how results are presented.

Policy Making: Governments need independent research before creating food guidelines. Otherwise, public health may suffer.

Consumer Awareness: Individuals should be careful about marketing claims. "Low-fat" or "healthy" labels do not always mean a product is good for health.

Recent Changes

In the last two decades, the scientific community has shifted its focus. Many studies now show that diets high in added sugar are linked with obesity, type 2 diabetes, heart disease, and even certain cancers. As a result:

The World Health Organization (WHO) recommends limiting added sugar to less than 10% of daily calories, and ideally under 5%.

Several countries have introduced sugar taxes on sweetened beverages to reduce consumption.

Public awareness campaigns encourage people to read food labels and cut down on sugary snacks and drinks.

Conclusion

The investigations into sugar industry influence reveal how powerful industries can shape science and health policy to protect their business interests. For decades, the risks of sugar were hidden, while fat was wrongly blamed as the main cause of heart disease. This misdirection affected generations of people and contributed to today's global health problems.

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NUTRITION

Abstract

Nutrition is the study of food and how it affects the health of our body. It provides the energy and nutrients needed for growth, repair, and overall well-being. Good nutrition helps prevent diseases and supports physical and mental development. This article explains the importance of nutrition, its types, and its role in maintaining a healthy life.

Introduction

Food is an essential part of life. The way we eat directly affects our health and lifestyle. Nutrition is not only about eating enough food but also about eating the right type of food in proper amounts. A balanced diet includes carbohydrates, proteins, fats, vitamins, minerals, and water. Each nutrient has its own role in keeping the body healthy and active.

Importance of Nutrition

Nutrition plays a key role in our daily lives. It helps in the following ways:

Provides energy for daily activities.

Helps in the growth and repair of body tissues.

Strengthens the immune system to fight diseases.

Improves concentration, memory, and mental health.

Reduces the risk of lifestyle diseases such as obesity, diabetes, and heart problems.

Types of Nutrients

The main nutrients required by the body are:

Carbohydrates – Main source of energy.

Proteins – Help in growth and repair of muscles and tissues.

Fats – Provide energy and protect organs.

Vitamins – Essential for proper functioning of the body (e.g., Vitamin A for eyesight, Vitamin C for immunity).

Minerals – Important for strong bones, teeth, and blood (e.g., calcium, iron).

Water – Maintains hydration and helps in digestion.

Balanced Diet

A balanced diet is one that contains all nutrients in the right proportion. It should include:

Fresh fruits and vegetables.

Whole grains like rice, wheat, and oats.

Pulses, milk, and lean meat for protein.

Nuts and seeds for healthy fats.

Plenty of clean water.

Sub Title 4: Poor Nutrition and Its Effects

Poor nutrition can lead to many health issues, such as:

Malnutrition and stunted growth.

Weak immunity and frequent illness.

Obesity due to excess junk food.

Lifestyle diseases like high blood pressure and diabetes.

Poor mental focus and low energy levels.

Conclusion

Nutrition is the foundation of good health. Eating a balanced diet with all essential nutrients keeps the body strong and the mind active. Developing healthy eating habits from a young age helps prevent diseases and ensures a better quality of life.

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WHAT IS NUTRITION AND ITS IMPACT ON HEALTH

Nutrition is a process of intaking food in correct and balanced proportions in which food from all the nutrients and minerals are present in the meal. Nutrition is a critical part of health and development. Better nutrition is related to improved infant, child and maternal health, stronger immune systems, safer pregnancy and childbirth, lower risk of non-communicable diseases (such as diabetes and cardiovascular disease), and longevity.

Healthy children learn better. People with adequate nutrition are more productive and can create opportunities to gradually break the cycles of poverty and hunger.

Malnutrition, in every form, presents significant threats to human health. Today the world faces a double burden of malnutrition that includes both malnutrition and overweight, especially in low- and middle-income countries. There are multiple forms of malnutrition, including wasting or stunting, inadequate vitamins or minerals, overweight, obesity, and resulting diet-related non-communicable diseases.

The developmental, economic, social, and medical impacts of the global burden of malnutrition are serious and lasting for individuals and their families, for communities and for countries. According to WHO

OBJECTIVES OF NUTRITION

Providing nutritional elements

To ensure the intake of adequate amounts of carbohydrates, proteins, fats, vitamins, minerals, and water necessary for various bodily functions.

Support Growth and Development:

To supply the necessary building blocks and energy for physical and mental growth, particularly critical during infancy, childhood, and adolescence.

Maintain Bodily Functions:

To fuel daily activities, including both voluntary actions like walking and involuntary processes like breathing and heart function, and to maintain constant body temperature.

Renew and Repair Cells:

To provide nutrients for the constant maintenance, renewal, and repair of body tissues and worn-out cells.

Regulate Bodily Processes:

To regulate and facilitate essential processes such as blood circulation, muscle contraction, and the removal of waste products from the body.

Promote Health and Prevent Disease:

To enhance the quality of life by optimizing health, strengthening the immune system, and reducing the risk of both deficiency diseases and chronic non-communicable diseases like cardiovascular disease, diabetes, and certain cancers

CONCLUSION

Prioritizing nutrition is key to unlocking overall well-being. By making informed choices, we can nourish our bodies and thrive

Ultimately, a balanced diet is the foundation of a healthy lifestyle. Let's strive to make every bite count and cultivate a deeper connection with the food we eat.

As we navigate the complexities of modern nutrition, remember that small steps today can lead to a lifetime of wellness and vitality."

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NUTRITION: MORE THAN JUST WHAT'S ON YOUR PLATE

The word *nutrition* sounds serious, doesn't it? Like something you'd read in a health textbook or hear from a doctor. But really, nutrition is just the story of what we eat and how our bodies respond to it. It's less about rules and more about the little choices we make each day—choices that decide whether we feel heavy and drained or light and alive.

Food Is Memory Too

If you think about it, food isn't only about nutrients. It's tied to memories. The smell of your grandmother's cooking, the comfort of a hot bowl of dal after a long day, or the joy of sharing street food with friends—these moments nourish us in ways science can't measure. Good nutrition should make space for both: the vitamins *and* the memories.

The Real Meaning of Balance

We often think "balance" means eating salad five days a week and treating yourself on the weekend. But balance isn't a schedule—it's a mindset. Some days, balance is choosing fruit over chips. Other days, balance is eating the cake without guilt because joy is part of health too.

Balance also means portion control. It's not about cutting out food groups but learning how much your body really needs. A plate that is half vegetables, a quarter protein, and a quarter grains is a simple starting point. Add some water, and you're already ahead of most packaged "health foods."

The Basics, Without the Jargon

- **Protein is repair work** – It's like the mason who fixes cracks in your walls. Without it, your body struggles to heal, grow, or even stay strong. Sources include eggs, beans, lentils, dairy, fish, and lean meat.
- **Carbs are fuel, not the enemy** – Whole grains, rice, and fruits are like kindling for your internal fire. They keep you moving, thinking, and functioning. The real culprit is refined carbs, like sugary drinks and white bread, that spike energy and then leave you drained.
- **Fats are cushions** – The right ones (nuts, seeds, avocados, olive oil) protect your heart, joints, and even your brain. Without them, vitamins like A, D, E, and K cannot even be absorbed properly.
- **Micronutrients are whispers** – Tiny but powerful, they quietly support everything from your eyesight to your immune system. A lack of even one vitamin can affect your mood, skin, or energy.
- **Water is life's reset button** – Nothing fancy, just sip often. Dehydration sneaks up through fatigue, headaches, or poor focus.

Today's Struggle: Too Much, Too Fast

The modern problem isn't hunger—it's *over-choice*. Hundreds of cereal boxes, flavored waters, and "diet" snacks compete for attention. And with fast food a tap away, eating has become less about fueling our bodies and more about convenience.

The irony is that we are surrounded by food, yet undernourished. Highly processed items are calorie-heavy but nutrient-light. This is why someone can eat a large meal and still feel unsatisfied—the body is still waiting for real nutrients.

Mindful eating is one answer. Not the kind that requires long meditation, but the simple act of noticing your food: eating without screens, chewing slowly, and asking, "How does this make me feel after I eat it?"

Nutrition Myths We Fall For

- **"Carbs make you fat."** Not true. It's the type and quantity of carbs that matter. Whole carbs like oats or brown rice give energy, while refined ones drain it.
- **"All fats are bad."** Actually, good fats are essential for hormones, brain health, and glowing skin. It's only trans fats (common in fried junk food) that harm us.
- **"Skipping meals helps weight loss."** Skipping meals often backfires. It slows metabolism and leads to overeating later.
- **"Supplements can replace food."** While supplements can help in deficiencies, they cannot copy the complex nutrition found in real foods.

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Practical Steps Anyone Can Try

1. Start your day with water instead of coffee or tea.

2. Add one fruit or vegetable to every meal.
3. Replace at least one sugary drink a day with plain water.
4. Cook at home more often—simple meals beat packaged ones.
5. Listen to your body's hunger and fullness cues.

These are not dramatic changes, but small habits that build a strong foundation over time.

The Takeaway

Nutrition isn't a punishment or a trend. It's a quiet, daily act of care. It's listening when your body says "I need water" or "I need rest." It's feeding yourself in a way that supports not just your organs, but also your happiness.

At the end of the day, food should make you feel good inside and out. Because true nutrition isn't just about living longer—it's about living better.

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NUTRITIONAL CHRONICLE

Introduction: More Than Just Food

Nutrition isn't just about calories and vitamins — it's about how we fuel our dreams, shape our moods, and build resilience. In a world of instant meals and endless distractions, understanding what we eat becomes a quiet act of self-respect. For students especially, nutrition is the invisible force behind energy, focus, and emotional balance.

Body and Mind: A Delicate Dance

Brain Fuel: Omega-3 fatty acids, found in walnuts and flaxseeds, enhance memory and cognitive function. A well-fed brain is a sharper, calmer, and more creative one.

Mood Matters: Deficiencies in B-vitamins and magnesium can lead to anxiety and fatigue. A colourful plate often leads to a brighter mood.

Immunity Boost: Vitamin C, zinc, and antioxidants from fruits and vegetables strengthen our defence system — a must for students juggling academics and social life.

The Student's Plate: Smart Choices for Busy Lives

Let's face it — between classes, assignments, and social media, meals often

become rushed or skipped. But small changes can make a big impact:

- Swap sugary snacks for nuts or fruit.
- Hydrate with water, not soda.
- Include protein in every meal — lentils, eggs, dairy, or tofu.
- Don't skip breakfast: it sets the tone for your metabolism and mood.

Nutrition and Social Impact

Healthy eating isn't just personal — it's communal. When students choose better food, they influence peers, reduce healthcare burdens, and contribute to a more mindful society. Imagine a campus where energy drinks are replaced by smoothies, and stress is managed with magnesium-rich meals instead of junk food binges.

Conclusion: A Call to Action

Nutrition is not a trend — it's a lifelong companion and a lifelong foundation for physical vitality and mental clarity. By making mindful choices today, we shape a future filled with strength, focus, and compassion. As students, we hold the power to influence not just our own well-being, but also the habits of our peers and communities. **Let's be the generation that eats not just to survive, but to thrive.** Let's choose to nourish ourselves — and inspire others to do the same.

"Nutrition is the quiet strength behind every bold step we take — feed your body, fuel your future."

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EXPLORING THE PAST, PRESENT, AND FUTURE OF HUMAN NUTRITION

Ancient Wisdom: The Origins of Nourishment

The story of nutrition begins long before modern science. Ancient societies recognized the intimate relationship between food and health.

Greece: Hippocrates famously declared, "Let food be thy medicine and medicine be thy food," emphasizing diet as the foundation of wellbeing.

India: Ayurveda developed detailed dietary systems, tailoring meals to body types and energy balances.

China: Traditional medicine identified "yin" and "yang" foods, seeking equilibrium in every dish.

For early civilizations, food was not simply fuel. It was medicine, ritual, and a vital expression of culture. These traditions remain influential, echoing in modern nutritional science.

The Industrial Era: The Rise of Processed Diets

The Industrial Revolution reshaped the global food landscape. Mechanized agriculture and food processing improved access and affordability, yet convenience came at a cost.

Refined grains lost vital nutrients.

Canned and packaged foods extended shelf life but introduced preservatives and additives.

Sugar consumption skyrocketed, fueling a surge in lifestyle diseases such as obesity and diabetes.

The industrial age solved hunger for millions but distanced communities from natural, whole foods. What was gained in efficiency was often lost in nutritional integrity.

The Modern Awakening: Back to Basics

Today, food is no longer just about survival. It reflects identity, values, and personal choices. Modern consumers are more health-conscious and environmentally aware than ever before.

Key Trends Shaping Contemporary Nutrition:

Plant-based and vegan diets gaining mainstream acceptance.

Organic farming and "farm-to-table" dining emphasizing freshness and sustainability.

Specialized diets such as keto, paleo, and intermittent fasting catering to lifestyle needs.

The rise of "superfoods" like quinoa, chia, and spirulina, marketed for their concentrated nutrients.

Social media has amplified food culture, transforming meals into visual experiences. Yet beneath the aesthetics lies a deeper shift: a renewed desire to reconnect with authenticity and nourishment.

The Future of Food: Science and Sustainability

The next chapter in The Nutritional Chronicle is being written with technology.

Advances in biotechnology and data science are pushing the boundaries of how we view food.

Personalized nutrition: Diets tailored to individual DNA, gut microbiomes, and metabolic responses.

Smart technology: Wearables and AI recommending meals based on real-time health data.

Alternative proteins: Lab-grown meat, plant-based substitutes, and insect-based proteins addressing sustainability concerns.

3D-printed meals: From space missions to humanitarian aid, offering precise nutrient control.

These innovations promise to revolutionize food systems, but they also raise ethical questions: Can technology replace tradition? Will future diets remain accessible to all, or deepen inequalities?

Why the Nutritional Chronicle Matters?

The story of food is the story of humanity itself. It connects past traditions with present innovations and future possibilities.

The past offers timeless wisdom about balance and simplicity.

The present highlights diversity, choice, and rediscovery.

The future challenges us to blend sustainability with technology.

Ultimately, nutrition is not only about what sustains life but also about what shapes cultures, economies, and identities.

Final Reflection

The Nutritional Chronicle reminds us that food is history, medicine, and future potential woven together. As societies advance, one truth endures: how we eat today will determine not just our health, but the health of generations to come.

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THE ROLE OF NUTRITION IN DAY TO DAY LIFE

Nutrition is the science of foods, the nutrients and other substances there in, their action, interaction and a balance in relationship to health and disease and the process by which the organism ingests, digests, absorbs, transports and utilizes nutrients and disposes their end products. In addition to this nutrition is considered as social, economic, cultural, psychological implications of food and eating. Nutrition is major factor in bringing out the maximum potentiality that one is endowed with both physically and mentally. Nutrition is the key aspect for the growth and development of this biological world. Every living being on this biosphere depends on food for their nourishment and growth. A proper diet must be followed to lead a healthy and a happy life. A diet with all the food components in required quantities with sufficient amounts of calories is known to be as a balanced diet. Nutrients are the food constituentsthat must be supplied to the body. These include carbohydrates, proteins, minerals, vitamins and water. Balanced diet provides numerous benefits to the overall health and wellbeing.

BENEFITS OF BALANCED DIET

A balanced diet helps in taking optimal nutrients which gives us proper nourishment.

Having a balanced diet provides necessary fuel to the body for the physical and physiological work.

Having a balanced diet can prevent all the unwanted diseases which can be caused either due to deficiency of food components or due to lowered immunity. And develops the immunity power.

Eating a balanced diet helps in maintaining proper and a healthy weight which prevents obesity and other chronic disorders like diabetes, cancer, cirrhosis etc.

Balanced diet also helps to maintain mental and psychological health.

A balanced diet promotes healthy skin, hair and nails.

MAINTENANCE OF BALANCED DIET

Include huge range of foods in your diet to ensure the intake of all the nutrients.

Should drink sufficient amount of water and stay hydrated throughout the day.

Include dairy products which provides required minerals to the body.

Take fresh fruits and vegetables everyday so as to obtain necessary vitamins.

Add pulses, cereals, grains and meat that are the rich in proteins and that helps in building up our body.

Take carbohydrates such as rice, wheat, maize, potatoes etc. These are the major sources of energy.

Some amount of fats also must be added to the diet so as to maintain a properand a healthy skin.

Intake of roughages helps in free bowel movements and prevents constipation.

Limiting the packaged foods and processed foods also helps in maintaining balanced diet.

MALNUTRITION

Malnutrition has been defined as a pathological state resulting from a relative or absolute deficiency or excess intake of one or more essential nutrients. The basic cause for mal nutrition is having an improper diet or not taking a balanced diet. So this can be prevented and cured by taking a balanced diet. This includes four forms:

UNDER NUTRITION is the condition which results insufficient food is taken over an extended period of time.

OVER NUTRITION is the pathological state resulting from the excessive intake of food over an extended period of time.

IMBALANCE is the pathological state resulting from a disproportion among the essential nutrients without any absolute deficiency.

In conclusion, a balanced diet is essential for the wellbeing of the mankind. By incorporating variety of foods, individuals can reap the benefits of the balanced diet. One can consult a health care professional for a personalized dietary advice.

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What is a Nutrition?

Nutrition is the science of food and how it affects the health, growth, and functioning of the body. It involves the intake, digestion, absorption, and utilization of nutrients.

What are the nutrients?

Nutrients are substances in food that provide energy, help in body growth, repair tissues, and regulate body functions. They are divided into two groups:

Macronutrients (needed in large amounts):

Carbohydrates → Main source of energy (e.g., rice, bread, potatoes).

Proteins → Growth, repair, and maintenance of tissues (e.g., milk, eggs, pulses, meat).

Fats → Provide energy, insulation, and help absorb vitamins (e.g., oils, nuts, butter).

Micronutrients (needed in small amounts):

Vitamins → Protect against diseases, regulate body processes.

Example: Vitamin A (vision), Vitamin C (immunity), Vitamin D (bones).

Minerals → Strong bones, healthy blood, nerve function.

Example: Calcium, Iron, Potassium.

Water →Essential for life, helps in digestion, circulation, and temperature.

Functions of Nutrition

Helps in growth and development of the body.

Strengthens the immune system to fight diseases.

Maintains overall health and well-being.

Balanced Diet

A balanced diet contains all nutrients in the right amounts—carbohydrates, proteins, fats, vitamins, minerals, water, and fibre.

Example: A plate with rice/chapatti, vegetables, dal, curd, fruits, and nuts.

Malnutrition

Poor nutrition can lead to health problems:

Undernutrition→ Stuntedgrowth, weakness, diseases like Kwashiorkor, Marasmus.

Over nutrition → Obesity, diabetes, heart problems.

Importance of nutrition

Healthy Diets May Lengthen Your Life

Reduces The Risk of Chronic Disease

Healthy Eating Positively Affects Your Mood.

Helps You Manage A Healthy Weight.
Maintains Your Immune System.

Delays the Effects Of Aging.

Conclusion

Nutrition is the foundation of good health. Eating a balanced diet, drinking enough water, and maintaining healthy eating habits ensures proper growth, strength, and a long, healthy life.

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NUTRITION IN FIRST 1000 DAYS OF LIFE

Abstract

The first 1000 days of life, from conception to two years of age, are a critical period of growth and development. Nutrition plays a vital role in shaping the child's future health, cognitive development, and overall well-being. This article highlights the importance of optimal nutrition during this period, the consequences of malnutrition, and strategies for promoting healthy nutrition.

The Importance of Nutrition in the First 1000 Days

The first 1000 days of life are a time of rapid growth and development. During this period, the child's brain, body, and immune system are shaped by the nutrients they receive. Adequate nutrition is essential for:

Brain development: Nutrients like iron, zinc, and omega-3 fatty acids support brain growth and development.

.Physical growth: Macronutrients like protein, carbohydrates, and fats support physical growth and development.

3. Immune system development: Nutrients like vitamin A, vitamin D, and zinc support immune system development.

Consequences of Malnutrition

Malnutrition during the first 1000 days can have long-term consequences, including:

Stunted growth: Malnutrition can lead to stunted growth and development.

.Cognitive impairment: Malnutrition can affect cognitive development and future academic performance.

.Increased disease risk: Malnutrition can increase the risk of diseases like diabetes, heart disease, and obesity.

Strategies for Promoting Healthy Nutrition

.Breastfeeding: Exclusive breastfeeding for the first six months is recommended.

Complementary feeding: Introduce nutrient-rich foods at six months.

Micronutrient supplementation Provide supplements like vitamin D and iron as recommended by healthcare professionals.

Maternal nutrition: Ensure pregnant and lactating women receive adequate nutrition.

Nutrient-Rich Foods to Include

Fruits: Mangoes, bananas, avocados, and berries rich in vitamins A and C.

Vegetable: Leafy greens like spinach, carrots, and sweet potatoes rich in vitamins A and K.

Protein sources: Chicken, fish, eggs, lentils, and chickpeas.

Whole grains: Brown rice, quinoa, whole wheat bread, and oats.

Dairy: Breast milk, formula (when necessary), and whole milk after one year.

Healthy fats: Nuts, seeds, avocados, and olive oil.

Specific Foods for Different Stages

6-8 months: Mashed bananas, avocados, pureed vegetables, and iron-rich pureed meats.

8-12 months: Soft fruits, mashed lentils, and small pieces of cooked chicken.

1-2 years: Variety of fruits, vegetables, whole grains, and protein sources.

Conclusion

The first 1000 days of life are a critical window of opportunity for promoting healthy growth and development. Optimal nutrition during this period can have long-term benefits for the child's health, cognitive development, and overall well-being.

Recommendations

Healthcare professionals: Provide guidance on optimal nutrition during the first 1000 days.

Parents and caregivers: Prioritize breastfeeding, complementary feeding, and micronutrient supplementation.

.Policymakers: Support programs promoting maternal and child nutrition.

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BSC.BIOTECHNOLOGY

Intermittent Fasting

Abstract

Intermittent fasting is an eating pattern alternating between fasting and eating periods. It supports weight loss, improves insulin sensitivity, heart and brain health, and promotes cellular repair. However, drawbacks include hunger, nutrient deficiencies, and unsuitability for some groups. Proper planning ensures its safety, effectiveness, and sustainability.

Introduction

In the modern world, lifestyle-related disorders such as obesity, type 2 diabetes, cardiovascular diseases, and metabolic syndrome have become increasingly prevalent. Diet and nutrition play a vital role in the prevention and management of these conditions. Among various dietary approaches, Intermittent Fasting (IF) has gained significant attention in recent years, not just as a weight-loss strategy but also as a potential tool for improving overall health and longevity. Unlike traditional diets that focus primarily on what foods to eat, intermittent fasting is unique because it emphasizes when food is consumed. This shift in focus makes it an appealing and relatively simple approach for many individuals seeking to improve health without adhering to restrictive food choices.

Definition of Intermittent Fasting

Intermittent fasting can be defined as a pattern of eating that alternates between periods of fasting (little or no calorie intake) and periods of normal eating. It is not a specific diet but rather a timed eating schedule.

Common methods include:

1) 1st Method: 16 hours of fasting and an 8-hour eating window daily.

2) 2nd Method: Normal eating on 5 days of the week and restricted calorie intake (about 500–600 calories) on 2 non-consecutive days.

3)Alternate-Day Fasting: Fasting every other day while eating normally on alternate days.

24-hour Fasting (Eat-Stop-Eat): Fasting for one or two 24-hour periods per week.

This flexibility in patterns allows individuals to choose the method best suited to their lifestyle and health goals.

Uses and Benefits of Intermittent Fasting

1. **Weight Loss and Fat Reduction:**

Intermittent fasting naturally reduces calorie intake and promotes fat burning during fasting hours. By lowering insulin levels, it facilitates the breakdown of stored fat for energy.

2. **Improved Insulin Sensitivity and Blood Sugar Control:**

IF helps reduce insulin resistance and stabilizes blood glucose levels. This makes it particularly useful in preventing or managing type 2 diabetes.

3. **Cardiovascular Health:**

Studies suggest that intermittent fasting can lower LDL cholesterol, triglycerides, and blood pressure, thereby reducing the risk of heart disease.

4. **Cellular Repair and Longevity:**

During fasting, the body initiates autophagy, a process that removes damaged cells and regenerates healthier ones. This mechanism is associated with slowing the aging process and extending lifespan in experimental studies.

5. **Brain Health and Cognitive Function:**

Fasting stimulates the production of brain-derived neurotrophic factor (BDNF), which supports learning, memory, and neuroplasticity. It may also protect against neurodegenerative diseases such as Alzheimer's and Parkinson's.

6. **Simplicity and Flexibility:**

Unlike strict diets, IF does not require extensive meal planning or calorie counting. Its focus on

timing rather than food restriction makes it easy to adapt to different lifestyles.

Drawbacks and Limitations of Intermittent Fasting

1. **Initial Side Effects:**

Beginners often experience hunger, weakness, headaches, dizziness, irritability, and difficulty concentrating as the body adapts to fasting.

2. **Risk of Overeating**:

Some individuals may overcompensate by overeating during eating windows, which can cancel out the benefits of fasting.

3. **Nutrient Deficiencies:**

If the diet is not carefully planned, fasting can lead to inadequate intake of essential nutrients such as proteins, vitamins, and minerals.

4. **Not Suitable for Everyone:**

Intermittent fasting is not recommended for pregnant or breastfeeding women, children, elderly individuals with frailty, people with a history of eating disorders, and those with chronic medical conditions unless approved by a physician.

5. **Potential Impact on Social and Work Life:**

Since meal timings become fixed, IF may interfere with family meals, social gatherings, and work schedules, leading to reduced adherence over time.

6. **Digestive Issues:**

Some individuals may develop bloating, constipation, or gastric discomfort due to irregular meal patterns.

Conclusion:

Intermittent fasting is an innovative dietary approach that emphasizes when food is consumed rather than what is eaten. It offers numerous health benefits, including weight management, improved insulin sensitivity, enhanced cardiovascular health, and potential longevity. At the same time, it is not without drawbacks—nutrient deficiencies, hunger-related discomfort, and unsuitability for certain populations remain valid concerns.

Ultimately, intermittent fasting can be an effective tool for improving health if practiced correctly and under proper guidance. Like any lifestyle modification, its success depends on individual needs, body responses, and sustainability. When combined with a balanced diet, regular exercise, and healthy habits, intermittent fasting may serve as a valuable approach to achieving long-term wellness.

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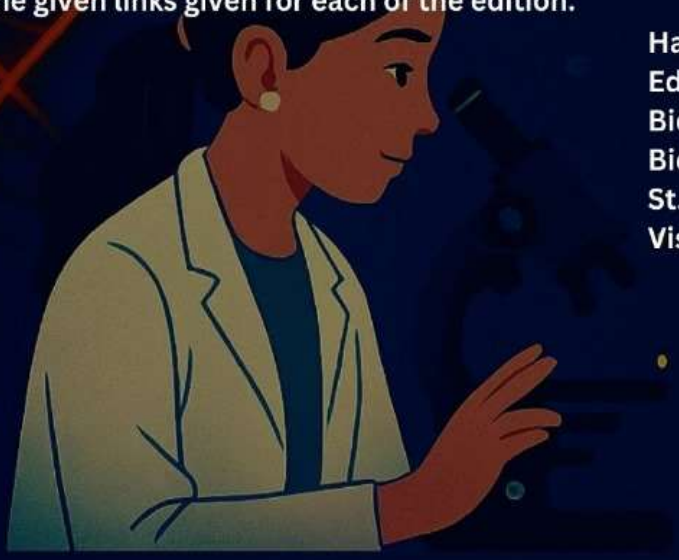
ABOUT THE MAGAZINE

Welcome to Bio Fanzine, the official bimonthly magazine of the Biomusketeers Club, St. Joseph's College for Women. This interdisciplinarity publication aims to provide a platform for students from diverse fields of biology, including Biochemistry, Biotechnology, Botany, Zoology, Agriculture, and Home Science, to share their knowledge, ideas, and research through article writing.

Article writing is a vital skill for biology students, as it enables them to develop their critical thinking, creativity, and communication skills. Through Bio Fanzine, we strive to foster a culture of scientific inquiry, innovation, and collaboration among our students.

We would like to acknowledge the tireless efforts of our student editors, who have worked diligently to bring this magazine to life. Their dedication, enthusiasm, and commitment to excellence are truly commendable. We are deeply grateful to our Principal Dr. Sr Shyji, Vice- Principal Sr. Hema and Management which include Sr. Mary, Sr. Daisy and Sr. Nancy for their unwavering support and encouragement. Their vision and leadership have enabled us to create this platform, which we believe will play a significant role in shaping the minds of our future scientists and leaders.

We hope that Bio Fanzine will serve as a catalyst for intellectual curiosity, creativity, and innovation among our students, and provide a platform for them to showcase their talents and achievements. Students from various science disciplines of the college and also other colleges will be invited for contributions to the E- Magazine. The soft copy of the editions or special releases of the magazine will be available at the given links given for each of the edition.



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