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Alternatives to Antibiotics in Poultry Production

Ms. Pavithra Ramalingam
Assistant Brand Manager
Avinova



INTRODUCTION

The poultry industry has undergone a dramatic change that began around 1950. In India, poultry is one of the fastest growing segments of the agricultural sector today, which transformed from a traditional, small-scale farming practice into a highly organized and vertically integrated agri-business.

The key factors responsible for the rapid growth of the poultry industry are vertical integration, technological advancements in the feeding, housing, and breeding techniques, increased demand for poultry products, export opportunities, government support and policies.

But with the growing & persistent concern over the usage of antibiotics & antibacterial resistance and their implications for poultry health, threats to food security and human health are the major challenges related to the consumption of poultry products.

To counteract all the above effects, there needs to be an alternate solution to antibiotic usage in poultry. Before getting into the alternate solution, let us look at the impact of using antibiotics in poultry farming in detail.

AN OVERVIEW - ANTIBIOTICS & ANTIMICROBIAL RESISTANCE

The discovery of antibiotics was a success in the prevention of infections, controlling infectious pathogens, and increasing feed efficiencies.

Antibiotics are chemicals produced by microorganisms such as bacteria. It is a drug that kills or slows the growth of bacteria. (Drugs that kill bacteria are referred to as bactericidal; those that slow the growth of bacteria are referred to as bacteriostatic).

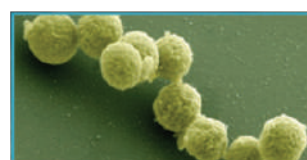
Bacteria counteract the actions of antibiotics by four well-known mechanisms, namely, enzyme modification, alteration in target binding sites, efflux activity, and decreased permeability of the bacterial membrane.

However, improper and massive use (long-term use, misuse, and overuse) of these antibiotics has led to increased problems of antibiotic resistance, and the presence of antibiotic residues in feed and the environment compromises human and poultry health.

ANTIBIOTICS IN POULTRY

In poultry, because of drug resistance, antibiotics and other antimicrobial medicines become ineffective, and infections become difficult to treat, increasing the risk of disease outbreaks furthering the risk associated with morbidity and mortality caused by resistant bacteria.

Considering all the above effects, it is time to think of alternatives to antibiotics to provide a good level of productivity, a low morbidity/mortality rate in poultry, and thereby preserving the environment and consumer health.



WAY FORWARD - NON-ANTIBIOTIC GROWTH PROMOTERS (NAGPs) FOR A BETTER FUTURE



There are indeed several alternatives that can be used as a substitute for antibiotic use. These alternatives give equal or better effects to antibiotics. Among these, the most popular and commonly used solutions are as follows,

1. Probiotics
2. Prebiotics
3. Synbiotics
4. PhytoGENICS/Phytobiotics/Phytochemicals
5. Organic acids
6. Bacteriophages

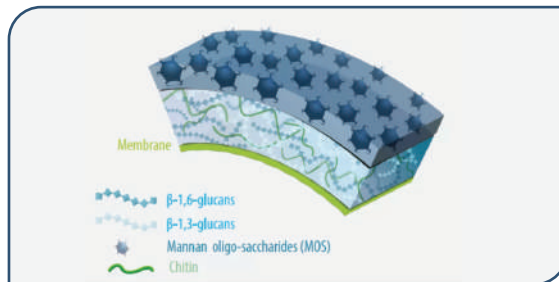
1. PROBIOTICS

Probiotics work by competitive exclusion - bacteria in the gastrointestinal environment produce substances that inhibit the growth of pathogenic microorganisms and compete with them for a place in the intestinal epithelium. It also stimulates the efficiency of the immune system, thereby producing a positive effect on the growth performance of poultry.

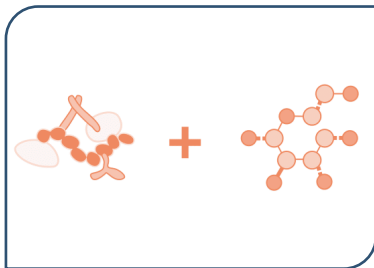


2. PREBIOTICS

Prebiotics are defined as dietary components that are not digested in the gastrointestinal tract and selectively stimulate the growth and/or activity of one or a specified number of bacteria.



3. SYNBIOTICS



Synbiotics is a combination of probiotics and prebiotics. There are two types of synbiotics, and the first one is complementary synbiotics, which consists of a probiotic and a prebiotic that together provide one or more health benefits but do not require co-dependent functions. The second one is a synergistic synbiotic, and it contains a substrate that is selectively utilized by co-administered microorganisms.

All these three, can enhance the gut health & performance, meat quality, and ammonia reduction.

4. PHYTOGENICS / PHYTOBIOTICS / PHYTOCHEMICALS

Plant secondary metabolites and essential oils are known as PhytoGENICS, are biologically active compounds that can promote feed efficiency by enhancing the production of digestive secretions and nutrient absorption, reduce the pathogenic load in the gut, exert antioxidant properties and decrease the microbial burden on the bird's immune status.

A broad range of plant-derived products may fall under the category of phytoGENIC feed additives:

- Herbs (Products from which leaves and flowers are used)
- Spices (non-leaf parts of plants, including seeds, fruits, bark, or root with intensive taste or smell)
- Essential oils (Volatile lipophilic substances obtained by cold extraction or by steam or alcohol distillation)
- Oleoresins (Extracts derived from non-aqueous solvents)

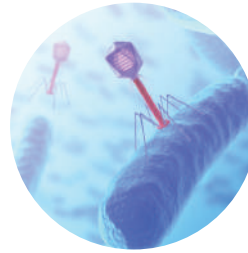


5. ORGANIC ACIDS/ACIDIFIERS



Acidifiers, or so-called organic acids, are organic compounds that possess acidic properties. They are used to lower the pH of the intestinal tract, which favours good microbes and, in turn, suppresses pathogenic microbes, thus minimizing the use of antibiotics.

6. BACTERIOPHAGES



A bacteriophage (phage) is a virus that infects and replicates within bacteria and kill the bacterial cells. They can be used to target pathogens alone or pathogens in groups. Their activity has been found promising both against Gram-positive and Gram-negative bacteria.

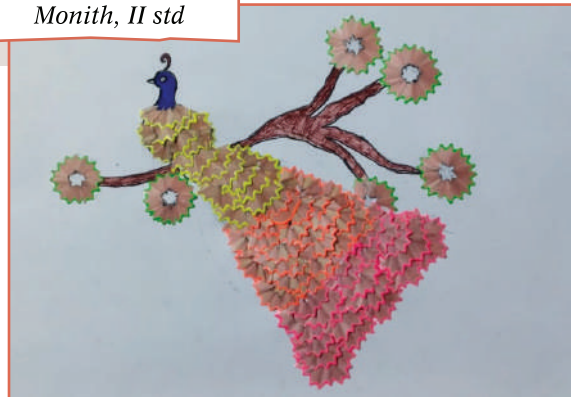
CONCLUSION

Over the years, antibiotics have played an important role in fighting infectious diseases and stimulating poultry growth. With the emergence of antimicrobial resistance, the pathogenicity and virulence of these organisms have increased, and treatment options are diminishing and becoming expensive.

Many trials of potential alternatives to antibiotics have shown very relevant results. These alternatives and combinations of these alternatives give equal or better effects to antibiotics to reduce morbidity and mortality rates in poultry and protect the environment and consumer health.

Bringing out the best: Creative Artwork by Provet Employees' Kids

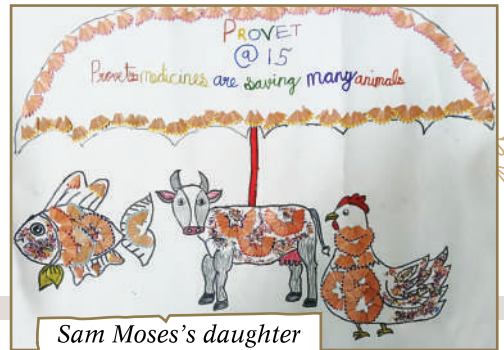
*E. Srinivasan's son
Monith, II std*



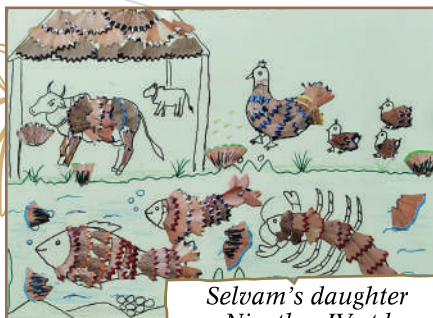
*Neeraj Kumar's daughter
Saanvi Sinha*



*Vanitha's daughter
Reneeka, IV std*



*Sam Moses's daughter
Jazlyn Lewanna, II std*



*Selvam's daughter
Nivetha, IV std*

Provet at Poultry India Expo 2024, Hyderabad



Provet participated in the prestigious 16th Poultry India Expo, Hyderabad, held at HITEX Exhibition Centre, from November 26th to 29th, 2024. This premier event brought together industry leaders, innovators, and experts in the poultry industry, offering a dynamic platform to exchange ideas, discover advancements, and foster meaningful connections.

Our participation in the expo was a unique opportunity to engage with key stakeholders, including poultry farmers, nutritionists, veterinarians, and industry specialists. By attending various discussions and presentations, we gained valuable insights into emerging trends, challenges, and innovative solutions shaping the future of poultry health and nutrition. Topics ranged from cutting-edge solutions and disease prevention strategies to sustainable practices and advancements in technology that are redefining industry standards.

The event also served as a platform for dialogue and collaboration. We were honoured to receive direct feedback from our customers and industry peers, enabling us to better understand their specific needs and expectations. These insights will play a crucial role in guiding our R&D efforts and helping us design more effective, customer-centric solutions to enhance poultry health and productivity.

In addition to knowledge-sharing, the expo was instrumental in strengthening existing partnerships and building new ones. We engaged in meaningful discussions with potential collaborators, distributors, and industry influencers, laying the foundation for future growth.

Overall, our participation at the expo was quite successful, and we're excited to use what we learned to better serve our customers and grow within the industry.



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@ Poultry India Expo, Hyderabad



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Provet at Poultry India Expo 2024, Hyderabad



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Provet at Poultry India Expo 2024, Hyderabad



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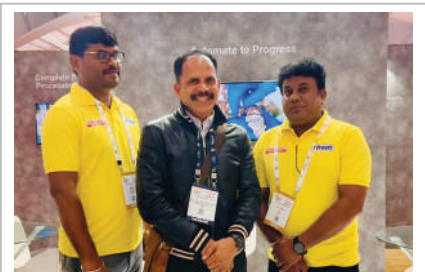
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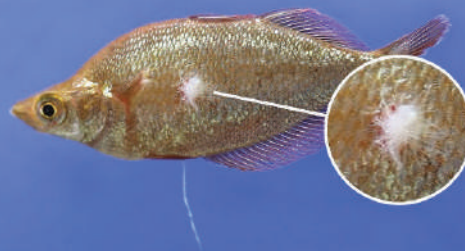
Layer Customers,
Gudur, North Karnataka



Final moments at the end of
Poultry India Expo, Hyderabad

Fungal Diseases of Fish – A Review

Dr. Vijay Sundar Deva
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Introduction:

Fungal infections (fungal infections are called mycoses) are among the most common diseases seen in temperate fish. Because fungal spores are found in all fish ponds and create problems in stressed fish. Poor water quality can also lead to an increase in fungal infections in an otherwise healthy fish population. Most fungal infections only attack the external tissues and only few fungal infections that will infect the internal organs of fish.

Below is a list of common fungal diseases in fish:

Saprolegniasis:

- **Caused by:** *Saprolegnia spp.*
- **Infection sites:** Skin and Gills



Symptoms:

- Cotton-like, white or greyish fungal growths on the skin, gills, or eggs, often resembling a fluffy or thread-like appearance.
- Affected areas may show tissue damage, lesions, and necrosis.
- In severe cases, fish may exhibit signs of discomfort such as lethargy, loss of appetite, or difficulty breathing (if gills are affected).
- On eggs, fungal infections can lead to discoloration and failure to hatch, reducing reproductive success.
- Secondary bacterial infections may develop because of tissue damage caused by the fungal growth.

Branchiomycosis:

- **Caused by** : *Branchiomyces spp.*
- **Infection sites** : Gills



Symptoms:

- **Gills become discolored:** Affected gills may appear pale, reddened, or have a greyish hue due to fungal infection.
- **Swollen and damaged gills:** Infected gill tissue becomes swollen and may develop lesions, making it difficult for fish to extract oxygen from the water.
- **Fungal growth:** The gills may become covered in cotton-like fungal growth, which can obstruct proper gill function, leading to respiratory distress.
- **Breathing difficulty:** Fish may exhibit labored breathing, rapid gill movement, and surface gasping as they struggle to breathe.
- **Lethargy and reduced activity:** Infected fish may become lethargic, spending more time near the surface of the water or hiding.
- **Secondary infections:** The compromised gill tissue is more susceptible to bacterial infections, which can worsen the fish's condition.

Epizootic Ulcerative Syndrome:

Aphanomyces invadans is a pathogenic fungus responsible for causing Epizootic Ulcerative Syndrome (EUS), a severe and often fatal disease in fish. EUS is characterized by the development of large, deep ulcers on the skin, gills, and internal organs, which are caused by the fungal infection.

- **Caused by:** *Aphanomyces invadans*, a water-borne fungus that infects fish primarily during times of environmental stress.



Infection Sites:

- **Skin:** The most visible and common site of infection, where deep, necrotic ulcers form, often leading to severe tissue damage.
- **Gills:** Fungal growth can extend to the gills, causing respiratory distress and impaired gas exchange.
- **Internal Organs:** In advanced stages, the infection can spread internally, affecting organs and leading to systemic failure.

Symptoms:

- **Ulcers:** Deep, irregular, and necrotic ulcers appear on the skin and gills, often with a grayish or yellowish color.
- **Skin lesions:** Fish may exhibit open sores with edges that appear raised or inflamed.
- **Severe tissue damage:** Infected tissues may slough off, leading to the exposure of underlying muscle or organs.
- **Swollen, inflamed gills:** Respiratory difficulties become evident as the gills become congested and infected.
- **Lethargy:** Infected fish may show signs of reduced activity, lethargy, and difficulty swimming.
- **Secondary infections:** Bacterial infections often follow fungal invasion, exacerbating the disease and leading to further health deterioration.

Prevention:

Aphanomyces invadans is a pathogenic fungus responsible for causing Epizootic Ulcerative Syndrome (EUS), a severe and often fatal disease in fish. EUS is characterized by the development of large, deep ulcers on the skin, gills, and internal organs, which are caused by the fungal infection.

1. Maintain Water Quality:

- Regular water testing and ensuring appropriate filtration can prevent fungal growth. Properly removing organic debris and maintaining low ammonia/nitrite levels will reduce fungal spores' potential to proliferate.

2. Reduce Stress Factors:

- Avoid overcrowding and ensure that fish have adequate space to swim and hide. Stress weakens fish immune systems, making them more prone to infections.
- Ensure stable water temperature and other parameters to avoid stressing the fish, which can create an environment conducive to fungal infections.

3. Quarantine New Fish:

- Always quarantine new fish for at least 2 weeks before introducing them to the main tank to monitor for any signs of fungal infections or other diseases.
- Disinfect all new equipment and gear to minimize the risk of introducing fungal spores into the tank.

4. Promptly Treat Injuries:

- Wounds and abrasions on fish should be promptly treated with **PROFECT PLUS @ 700g/acre** to prevent fungal infections like Saprolegniasis, Branchiomycosis and EUS etc.
- Ensure that the fish is not exposed to sharp objects or environmental stressors that could cause injury.

Conclusion:

Fungal diseases in fish, caused by various pathogens like *Saprolegnia*, *Branchiomyces*, and *Aphanomyces invadans*, pose significant risks to aquatic life. These infections typically target the skin, gills, and eggs, leading to symptoms such as lesions, discoloration, tissue decay, and respiratory distress. By minimizing stress and improving water quality, fish populations can be better protected from this devastating fungal infection.

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Effective against WSSV, MBV and other viruses.

Reduces the incidence of disease outbreak and enhance survivability.



*Triple Salt
Formula with
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Provet Organizes Technical Seminars for Poultry Farmers in Haryana

Provet organized two impactful Technical Seminars in Haryana, focusing on helping poultry farmers address key challenges and improve their operations.

Technical Seminar for Layer Farmers

On 7th November 2024, a seminar was held in Mehendergarh, bringing together 15–20 layer farmers. Dr. B.C. Dutta, a renowned Poultry Consultant, delivered an insightful presentation on **"Egg Shell Quality and Egg Production."** The session focused on innovative strategies to enhance egg production and improve shell quality, encouraging active discussions and knowledge sharing. Participants left with actionable insights to boost their productivity. The seminar concluded with a networking lunch, providing an opportunity for meaningful engagement.

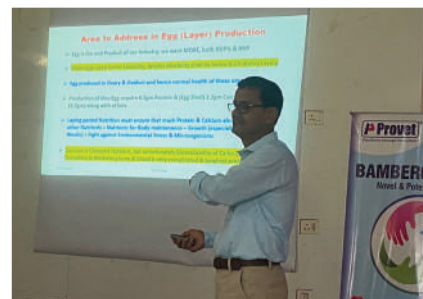
Technical Seminar for Broiler Farmers

On 8th November 2024, Provet hosted an interactive workshop in Loharu for 35–40 broiler farmers. Dr. Dutta addressed key challenges in **"Mitigating Challenges in Commercial Broiler Production,"** such as feed conversion ratio (FCR) and weight gain. He emphasized the critical role of Biosecurity measures before and after chick arrival, fostering open dialogue among participants to share experiences and solutions.

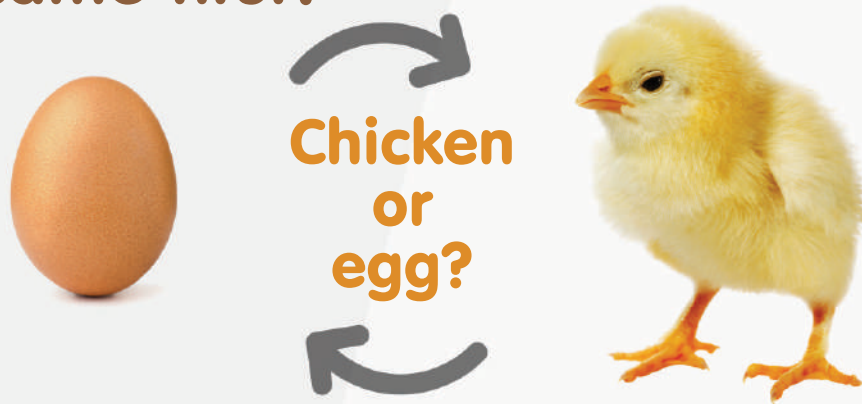
Supporting Farmers and Building Connections

Both seminars provided a platform for farmers to learn, discuss their concerns, and connect with each other. Provet remains committed to supporting poultry farmers with practical solutions and expert guidance, helping them succeed in their businesses.

These events reflect Provet's dedication to building strong relationships with farmers and advancing the poultry industry.



What came first?



One of the earliest and most often debated questions among human beings of all time is about which one came first! To solve this, it is necessary to turn back to history and evolutionary origins of chickens.

Broadly, eggs are found throughout the animal kingdom. Technically, an egg is a membrane-bound container in which an embryo can develop into an independent being. These eggs first appeared with the evolution of the first amniotes many millions of years ago. Before the appearance of the first amniotes, most animals reproduce in water; they laid their eggs in ponds and other moist habitats to keep them from drying out.

Evolution of amniotic eggs

At some point, there was a new sort of egg, this time with three more membranes within it: chorion, amnion, and allantois, which began to evolve. Although each membrane has its specific function, when put together, these envelop an integrated, all-in-one life support system. This new structure allowed embryos to take in stored nutrients, store waste products, and respire, making it possible for animals to lay their eggs on land.

Occurrence of the first chicken

According to the Australian Academy of Science, the very first chicken would have been the result of a genetic mutation (or mutations) occurring in a zygote produced by two proto-chickens. This means that two proto chickens mated, combining their DNA to form the very first cell of the very first chicken. During this process, genetic mutations occurred in that initial cell, and these mutations were then replicated in every subsequent cell as the chicken embryo developed and resulted in the first chicken.

According to research, the amniotic eggs made their debut roughly 340 million years ago and the first chickens evolved around 58,000 years ago at the earliest, it's reasonable to assert that the egg came first. Amniotic eggs existed long before chickens did, providing the necessary environment for various animal embryos to develop.

Chicken eggs have a special protein

However, there is one specific protein called ovocleidin-17, or OC-17, which exists only in the ovary of a chicken. Scientists concluded that the chicken must have preceded the chicken egg

because OC-17 was necessary for the formation of an eggshell. This protein accelerates the process of forming the eggshell so hens can build their egg from scratch and can lay them in 24 hours.

What really came first?

So ultimately the argument comes back to that age-old riddle. While there can be no denying that eggs in general predate chickens, the specific formation of chicken eggs involves the presence of chickens to produce the necessary protein. Thus, it is important to note that the chicken and the egg are mutually dependent. Therefore, chicken eggs are intrinsically tied to the existence of chickens themselves.

How do modern farming eggs differ from proto eggs?

Modern farming eggs differ significantly from proto eggs in terms of production methods and hen rearing conditions. Modern eggs come from industrialized farms where hens are kept in controlled environments, maximizing productivity but raising ethical concerns. These eggs are produced in large quantities and adhere to strict food safety standards, offering various types like conventional, free-range, and organic. Conversely, proto eggs were produced using traditional methods, with hens roaming freely and foraging naturally. This resulted in smaller production and eggs with potentially different nutritional content. The modernisation highlights changes in agricultural practices, emphasizing efficiency but also ethical considerations.

Is eating chicken healthier or eggs?

Both chicken and eggs offer substantial health benefits but differ in their nutritional profiles. Lean chicken is an excellent source of high-quality protein, essential vitamins such as B3 (niacin), and minerals, making it ideal for those seeking to build muscle or maintain a low-calorie diet. Conversely, eggs are nutrient-dense, providing a balance of protein, vitamins like D and B12, minerals including iron and selenium, and healthy fats. They also contain antioxidants that support eye health and overall well-being. Ultimately, the choice between chicken and eggs depends on individual dietary needs and preferences.

Reference: TOI Lifestyle Desk

Cake, Gifts, Ice Cream and Life

A beautifully decorated cake is undeniably pleasing to the eye, captivating our attention with its intricate designs and vibrant colours. However, the true purpose of a cake goes beyond mere aesthetics; it is crafted to be savoured and enjoyed. Each bite offers a delightful combination of flavours and textures, making the tasting experience as necessary as the visual appeal.



Similarly, a well-wrapped gift, adorned with colourful paper and elegant ribbons, is an art in itself, meant to create excitement and anticipation. Yet, its actual value lies in the joy of unwrapping it and discovering the treasures it conceals within. The moment of unveiling can bring happiness and surprise, highlighting that the presentation is only the beginning of the experience.

In the same way, a perfectly topped ice cream sundae delights our eyes and entices our taste buds. The layers of creamy ice cream, decadent toppings, and delightful sprinkles create a sensational treat. To fully appreciate it, we must dive in and enjoy each delicious mouthful, allowing ourselves to relish the various flavours and sensations.



Just as these delightful creations serve a deeper purpose, life should not be confined to discussions within the comfort of four walls. It is meant to be lived and experienced in all its richness. Life offers countless opportunities for growth and joy through activities like learning new skills, exploring different places, engaging in meaningful conversations, playing with friends, sharing laughter, and even navigating through tears. Each of these experiences adds a unique layer to our lives.

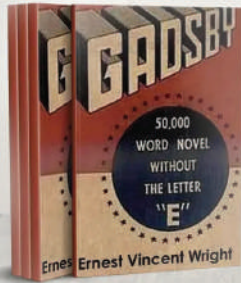
Lessons Learnt: Let us embrace every aspect of life with the same enthusiasm we reserve for cake, gifts, and ice cream. Just as we enjoy tasting a delicious cake, unwrapping a thoughtful gift, or refreshing ice cream on a sunny day, we should also learn to savour life's moments. We must engage fully, allowing ourselves to explore and cherish the adventures life has in store.

Courtesy M.L. Narendra Kumar



Did you know?

The 1939 novel Gadsby is the longest book ever published that doesn't contain the letter 'e.'

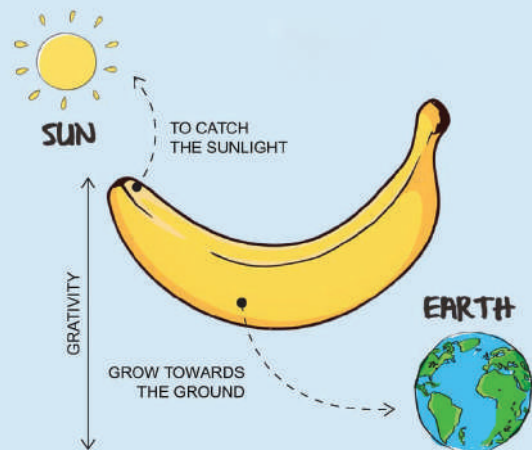


Back in 1939, American author Ernest Vincent Wright published *Gadsby*, a 50,000-word novel that doesn't use the letter 'e' once. What's more, it's not the only novel that ditched the letter. Author Georges Perec also wrote the French-language book *La Disparition* without the letter 'e' in 1969. That's even more astounding when you consider that 'e' is the most commonly used letter in the English (and French!) language.

Bananas are curved because they grow towards the sun

Philosophers have pondered the shape of bananas for a long time, arguing until the sun goes down as to why they're curved.

Bananas go through a process called "negative geo-tropism." This process causes the fruit to grow upwards toward the sun instead of the ground. This, in turn, gives the banana its familiar curved shape.



Are figs non-vegetarian? Know the truth!

Fig trees have no blossoms on their branches. The blossom is inside of the fruit! Many tiny flowers produce the crunchy little edible seeds that give figs their unique texture.

When the fig plant is being pollinated, a female wasp enters a fig through a tiny opening, losing her wings in the process. As she is unable to get out, she lays her eggs inside the flower and dies. When the eggs hatch, the male wasps mate with female wasps. While the female escapes, the male dies inside.

Hence, a debate over figs' vegan status has gone viral due to their unique pollination process with wasps, which some claim makes them non-vegetarian.



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