PalmSphere

FEBRUARY 2025 VOL:08

MPOC

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Photo Credit @ Norhisham Razi 2024

MESSAGE FROM THE CEO

Belvinder Sron
CEO of MPOC

Dear Readers,

Welcome to 2025—a year that promises new opportunities for progress, innovation, and sustainability. At MPOC, we remain steadfast in our mission to drive responsible growth in the Malaysian palm oil industry while ensuring environmental stewardship is at the forefront of our approach.

This edition of PalmSphere illuminates palm oil's transformative potential beyond its traditional uses. Our cover story delves into the remarkable health benefits of tocotrienols, a form of vitamin E found in palm oil and serves as a natural shield for the body's immunity and wellness. As health-conscious lifestyles gain momentum globally, palm oil continues to stand out as a versatile, nutrient-rich resource with immense potential.

We revisit the Biodiversity and Ecosystem Function in Tropical Agriculture (BEFTA) project, reinforcing the vital connection between agricultural productivity and biodiversity, as well as how sustainability is an ideal practice that can be embedded into the industry's DNA. Additionally, Sarawak Land Consolidation and Rehabilitation Authority's (SALCRA) focus on High Conservation Value (HCV) assessments exemplifies how we can protect biodiversity while fostering economic growth.

As sustainability becomes central to global priorities, MPOC is proud to champion an industry that supports livelihoods, enhances food security, and drives innovation. Thank you for supporting PalmSphere and the Malaysian palm oil industry. Let us make 2025 a year of purposeful action and sustainable success together.

EMPOWERING IMMUNITY: THE ROLE OF TOCOTRIENOLS AND NUTRITION

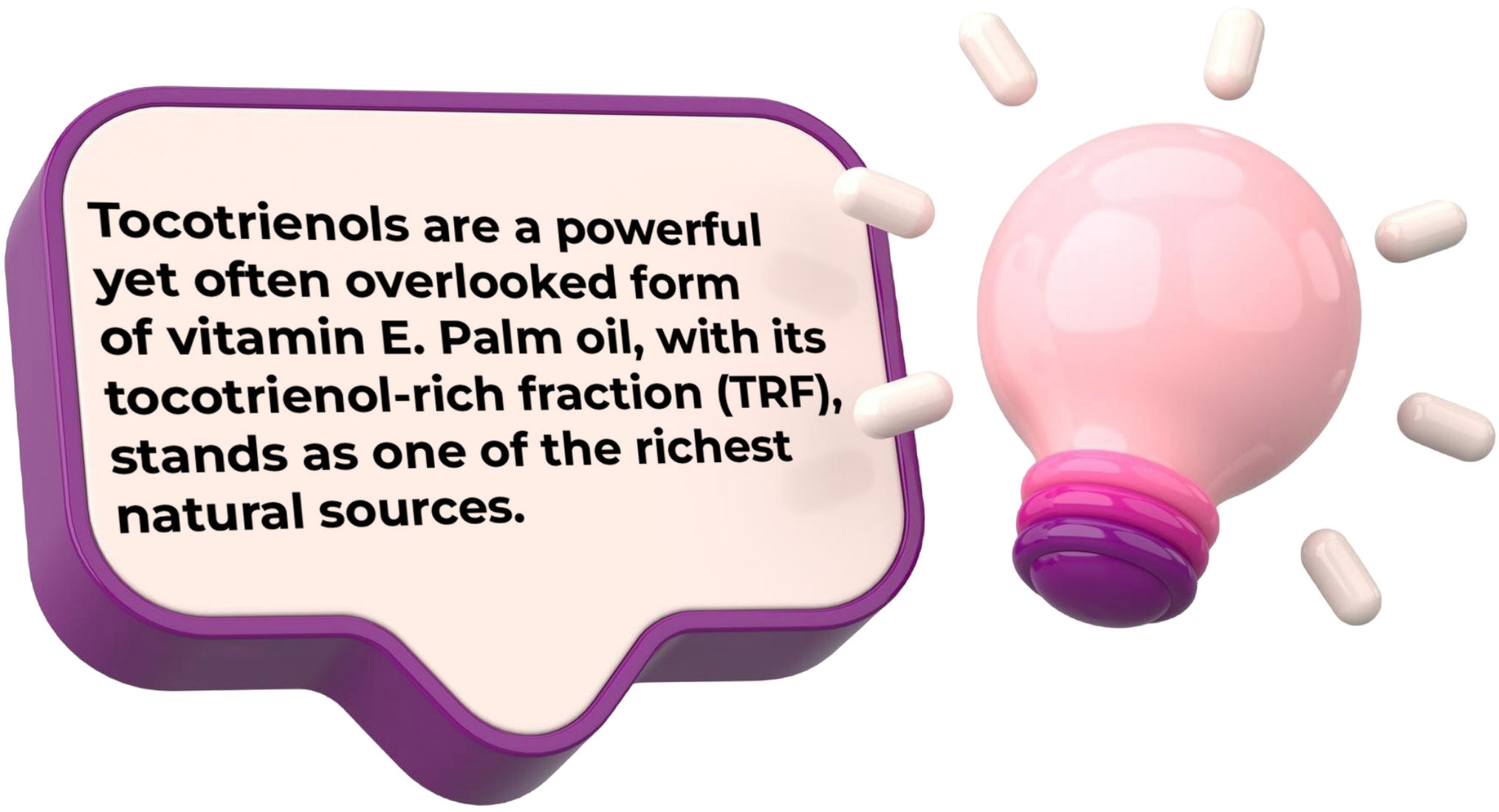
By Professor Ammu K Radhakrishnan

THE COVID-19 pandemic brought unprecedented challenges to global health, affecting millions of lives and overwhelming healthcare systems worldwide. Furthermore, COVID-19 exposed the vulnerabilities of populations already burdened by non-communicable diseases, many of which are linked to suboptimal nutrition and lifestyle factors. One of the most profound lessons learned was the importance of a healthy and functional immune system, where it became increasingly evident that a well-functioning immune system is essential for preventing severe infections and mitigating their long-term effects.

Low Immunity and Dietary Needs

The ability of the COVID-19 virus to cause severe disease, especially in individuals with weakened immunity, such as the elderly, those with chronic diseases, and individuals with poor nutritional status, highlighted immunity as a key determinant of disease outcomes. Nutrition and healthy lifestyle practices are key to having a healthy and functional immune system, which spurred widespread interest in understanding how nutritional interventions could bolster immunity.

The ability of the host immune system to mount effective defences against pathogens involves genetic and environmental factors, as well as the availability of essential nutrients. Vitamins such as D, C, and E as well as minerals like zinc and selenium have been identified as pivotal in modulating immune responses. Deficiencies in these nutrients were associated with increased susceptibility to infections, highlighting the importance of dietary adequacy in maintaining immune health studies.

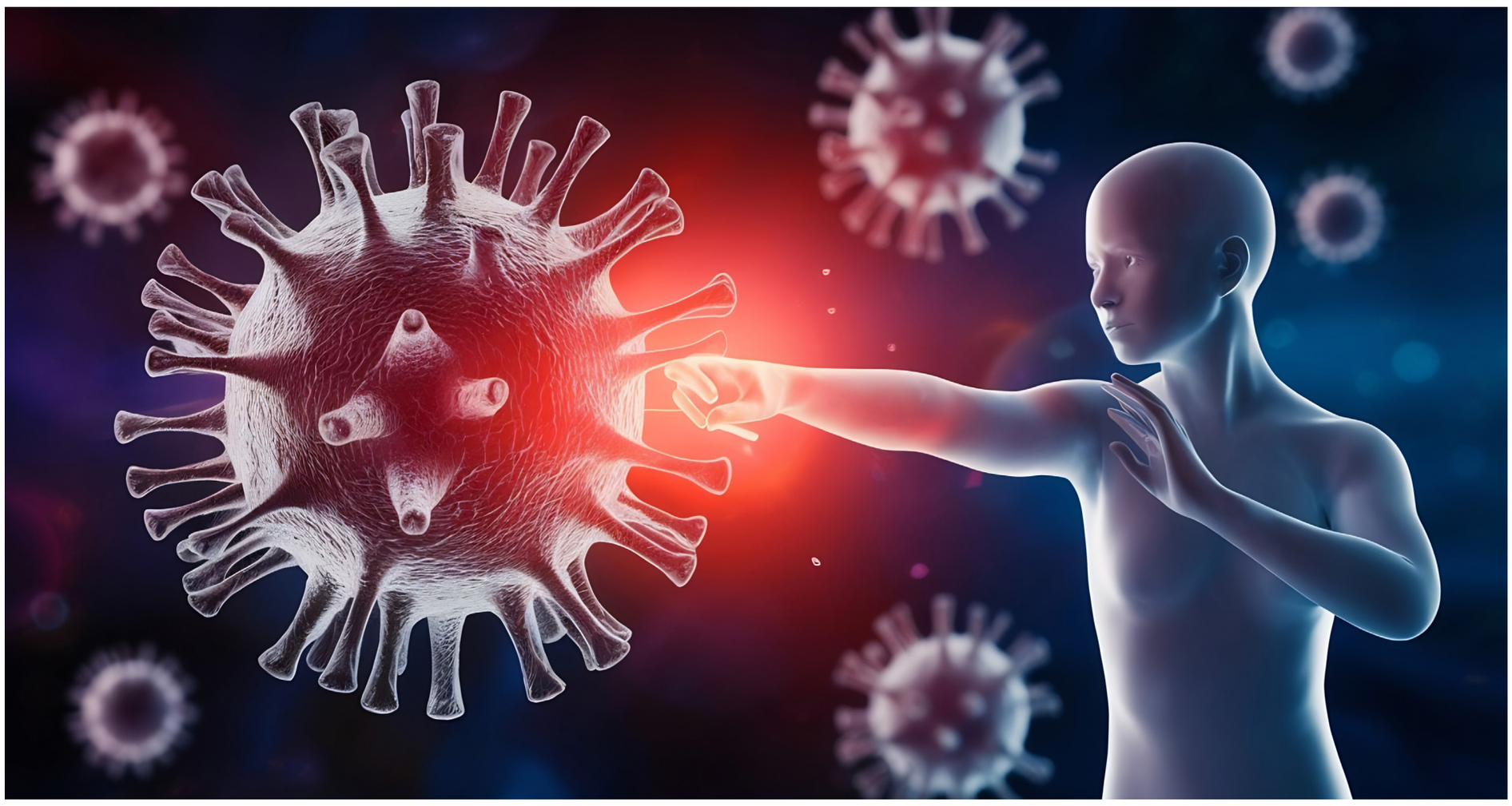


Research has demonstrated that palm tocotrienols can help boost the immune response. Two key studies, one involving human participants (Mahalingam et al., 2011) and another with animal models (Radhakrishnan et al., 2013), showed that palm tocotrienols significantly enhance cellular immunity and antibody production, particularly in response to the tetanus toxoid vaccine. This suggests their potential in improving vaccination outcomes.

Furthermore, research findings by Mahalingam et al. (2011) demonstrated that palm tocotrienols enhance the body's production of vaccine-specific antibodies and a key signalling molecule that activates part of the immune system, helping to combat infections caused by viruses and certain bacteria.

Additionally, it lowers the amount of pro-inflammatory substances in the body, such as a marker known as IL-6, showing its potential to reduce inflammation. Increased levels of specific antibodies indicate a boost in the immune response that helps protect the body from infections over the long term.

Tocotrienols have emerged as potent immunomodulatory agents with effects that extend beyond those of tocopherols, the more well-known form of vitamin E. The immune-enhancing effects underline tocotrienols' potential as vital nutrients for maintaining and boosting immunity. However, these benefits are maximised through good nutrition, which facilitates absorption, synergises with other micronutrients, and supports a balanced immune environment. As the world focuses on resilience against infections post-COVID-19, integrating tocotrienol-rich foods and supplements into a well-rounded diet is promising for bolstering immune health.



Tocotrienols have immune-enhancing properties, emphasising the role of maintaining and boosting immunity.

Professor Ammu K Radhakrishnan is a Professor of Immunology at the Jeffrey Cheah School of Medicine and Health Sciences, Monash University Malaysia. She obtained a First-Class Honours Bachelor of Science degree in Biochemistry and a Master of Science (MSc) degree from the University of Malaya (UM), Kuala Lumpur. Professor Ammu obtained her Doctor of Philosophy (PhD) degree in immunotherapy from the University of Cambridge, UK.

She is a Fellow of the Royal Society of Biology, the Cambridge Commonwealth Trust and the Cambridge Philosophical. Her main research areas are immuno-regulation and immunotherapy in cancer, as well as the use of natural compounds to enhance host immune responses to cancer. She has successfully supervised many research students at the doctoral, master's, as well as undergraduate levels and has published extensively in her area of research.

Braconid wasp Cotesia on *Pepulut/Caesar weed (Urena lobata)* flower bud.

Photo Credit @ Norhisham Razi 2024

INNOVATIONS IN PRACTICE: NATURE IN OIL PALM

In part 2 of the Innovations in Practice: Nature in Oil Palm article, Wild Asia continues its collaboration with various partners to develop nature-based solutions that support smallholders' and growers' sustainable oil palm journeys.

The BEFTA Project

For the BEFTA Project, Wild Asia partnered with the University of Cambridge to understand and quantify the existing levels of biodiversity, ecosystem functions, and yields on smallholder plots. The project is an extension of the BEFTA (Biodiversity and Ecosystem Function in Tropical Agriculture) programme, a large-scale experiment to investigate ways that tropical agricultural ecosystems can be managed to benefit biodiversity, associated ecosystem services (such as pest control and decomposition), and to increase the long-term sustainability of crops.

The early stages of the project, launched in Indonesia in 2013, were a collaboration between Cambridge and Sinar Mas Agro Resources and Research Institute (SMARTRI), which focused on large-scale oil palm plantations.

Innovations in Practice is a series that showcases MSPO (Malaysian Sustainable Palm Oil) certified farmers who adopt sustainable land management practices and carbon removals via nature-based as well as low-tech solutions as the pathway to net-zero palm oil.

“We got exciting results demonstrating the value of maintaining understory in oil palm for a wide variety of biodiversity. The key groups that benefit are predators and soil organisms.”

Leader of BEFTA project from Cambridge’s Department of Zoology, Dr Edgar Turner

However, applying the results to smallholder farms is a different ball game. Hence, Dr. Turner’s team reached out to Wild Asia due to their expertise and experience working with smallholders.

“We were also eager to include Malaysia and Indonesia in the project, as these are the two biggest producers, and the smallholder context and the management’s differ between countries,” Turner adds. His team also works with smallholders in Riau (Indonesia) through SMARTRI.

The BEFTA Understory Vegetation Project, which includes researchers and oil palm experts from Malaysia, Indonesia, and the UK, aims to quantify smallholder farmers’ attitudes to biodiversity and management practices, biodiversity and ecosystem processes, yields, as well as profitability. From June 2021 to November 2022, WA’s field team conducted social, environmental, biodiversity, and greenhouse gas (GHG) surveys in 50 MSPO-certified smallholdings, including WAGS BIO farms, in Perak.

Photo Credit @ Norhisham Razi 2024

Weaver ants that help combat bagworms found in *Sendudok (Melastoma)* flowers.

The surveys collated information on the farmers' chemical usage, their farms' understory and cover, insect diversity and population, as well as soil and tree health. Although Dr Turner's team is still processing the data in more detail, they have uncovered some preliminary results.

One key finding shows that farms where palm trunks are covered with epiphytic ferns (and other plants) are generally healthier and produce higher yields than farms where **epiphytes are routinely removed from the trees.

In conventional oil palm farming, epiphyte removal is recommended (Turner and Gillbanks, 2003), and the practice still prevails today. Studies have investigated the effects of epiphytes on oil palms and found no loss of yield but benefits for biodiversity where epiphytes are present (Prescott et al., 2015).

"We have yet to understand the correlation between epiphyte presence and higher yield, but it fits the narrative of how increased diversity benefits the palms," says John Howes. "It's also intriguing that these vertical gardens on the palm trunks probably play an important role in recycling and feeding nutrients into the root zone at the base of the palm."

Ultimately, the BEFTA results will generate crucial information on how best to manage ground vegetation in oil palm farms to optimise the benefits for biodiversity, ecosystem functions, and crop profitability.

"We'd like to combine the results from the Cambridge understory vegetation study with the Sustainable Agriculture Network (SAN) project to promote understory growth management that incorporates elements of cut and drop (trimming and letting the understory decompose naturally on the ground), beneficial plant reservoirs and insect refuge to increase biodiversity and interconnectedness - specifically along natural corridors such as water courses and edges, and manmade structures like road verges," Howes adds.

Realities on the Ground

For smallholder farmers, the common barriers to adopting nature-friendly approaches range from limited resources - time, money and energy- to understanding agrochemical usage and soil conservation.

Mat Jailani, one of the SAN project participants, manages 40 hectares of oil palm smallholdings, including leased farms. However, only his 0.6ha-BIO plot nurtures the habitat islands to date.

"It would take a lot of time and resources to replicate the habitat islands on all my farm plots," Mat Jailani admits. However, he is determined to adopt nature-based solutions one farm at a time. "It's the way forward!"

Chiam Siew Boey's farm, another SAN project trial plot, was somewhat spared from a severe bagworm outbreak in 2023 thanks to the habitat islands.

"The beneficial plants are effective to deter bagworms, to a degree. However, if my neighbouring farms suffer from severe infestations and they're not following the same practices (using nature-based solutions), my farm will be affected eventually," says Chiam. Her plot is adjacent to a housing estate surrounded by three conventionally-run farms with different owners.

During SAN's initial survey, SAN Senior Technical Advisor, Oliver Bach explained that rampant use of agrochemicals was common amongst farmers, affecting important plant resources for beneficial insects and influencing these organisms' soil life and larval stages.

In 2023, SAN and CABI jointly conducted an integrated pest management (IPM)/Pesticide Training-of-Trainer workshop to teach WA's field team practical tools for IPM and safe pesticide application in oil palm. In May 2024, WA ran the first training for smallholders in Perak on safer alternatives to banned or harmful agrochemicals and how to calculate chemical concentrations. A similar workshop for Johor-based smallholders is lined up for August.

Changing Mindsets

Fundamentally, these projects and initiatives are only as good as the farmers willing to change their mindsets. One prevalent notion is that oil palm estates or farms should be free of straggly shrubs or understory.

Based on his 20-year experience working with various oil palm estate managers and staff, Wild Asia Technical Advisor and Ecologist John Howes says:

For the last century, estate players in Southeast Asia have adopted a set of British colonial ideas that estates should be 'clean' and 'tidy,' reflecting good management and efficiency. These ideas weren't based on science but have persisted despite years of research by Malaysian Palm Oil Board (MPOB) and other institutions.

One example is the systemic practice of clearing woody plants, typically strait rhododendron and Urena lobata (Caesar weed). Howes explained that planters repeatedly state that these plants "compete for nutrients with the oil palms" and should, therefore, be eradicated. However, a Universiti Putra Malaysia (UPM) study revealed that both plants play vital roles in natural pest control. In my view, they may not 'compete' per se but probably absorb excess nutrients in the form of inorganic fertilisers, hence the idea of competition. Our work shows that these understory "woodies" can provide refuge for predatory insects and pollinators, enhance overall field diversity, contribute to soil health, and reduce erosion.

Also, preliminary data from the BEFTA project indicates that income and socio-economic factors correspond with farmers' levels of participation in partnership schemes like the Wild Asia Group Scheme or WAGS BIO. Across Southeast Asia, oil palm has historically been farmed as a profit-driven crop, lacking its cultural or sustenance background it has in its native West Africa. Smallholders are more likely to participate in schemes and adopt sustainable practices if there are financial incentives or premiums generated by certified palm oil.

Howes also believes that the key to changing mindsets is the farmers themselves. Many WAGS members are off-site farmers who employ contractors to do the grunt work and prioritise efficiency at low costs.

"Although my farm is a good case study on the benefits of habitat islands in reducing pest attacks and increasing soil health, some farmers found it challenging to adopt a similar practice. Most of them hire contract workers to manage their farms, and these workers prefer to use herbicide because it's less work or they would mistakenly kill the beneficial plants," says Neoh, an MSPO-certified smallholder. To inspire his farming peers to adopt natural pest control, Neoh grows beneficial plant saplings and hands them out to his peers.

A quintessential hands-on farmer, Neoh's sustainable farming journey started in 2015 when his yields dropped and his tree trunks rotted due to excessive pesticide use. With guidance from Wild Asia, he began exploring chemical-free farming methods and switched to using a grass cutter to manage weeds. Neoh has not used any agrochemicals since 2017. He concocts and applies EM (effective microorganisms) liquid fertiliser on his farm and uses commercial organic fertiliser (Seacharcoal) as a supplement.

"Those farmers who actually farm are the ones who care enough to change things," adds Howes. "We need more local champions like Neoh and Mat Jailani to inspire others. Likewise, the estates need to see the benefits and profits before they're willing to move forward."

The Big Picture

Farm management aside, landscape management and partnerships should be part of the overall equation, Howes added.

Howes reiterates, "We must take a landscape approach in planning to protect biodiversity, ecosystem functioning, and the robustness of our agricultural systems. "



Chiam Siew Boey's habitat island grows beneficial flowering plants such as *Sickle pod (Cassia tora)* and *Pepulut/Caesar weed (Urena lobata)*.

Recent studies have shown that an oil palm landscape with diverse and complex vegetation and connectivity can support biodiversity and provide economic benefits. Connected landscapes and corridors can also provide habitat for beneficial predators and balance ecosystem processes. The authors also stress "the importance of using land-sharing and land-sparing techniques simultaneously—setting some land aside from human use for conservation and integrating conservation practices on land being used."

"Landscape connectivity is the key concept for the future," says Howes.

However, the government must provide stimulus and work with local authorities and environmental organisations to make it happen. Most landowners (estates) must be aware of their responsibilities, and smallholders can take advantage of incentives. "Farmers and estates are the stewards of our landscapes. And if Wild Asia can show what that stewardship means and what it entails, I believe we can change the face of monoculture in Malaysia," Howes sums up.

Big dreams, perhaps. But the wheels are already in motion.

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*In a 2021 project in Costa Rica, SAN helped build the capacity and skills of smallholder farmers from an oil palm and cocoa cooperative to implement sustainable agricultural practices.
** An epiphyte is a plant, like ferns and orchids, that grows on another plant (e.g., on tree trunks).
The results of SAN Phase 1 and 2 are now published in the journal Cogent Food & Agriculture (OAFA): A. R. Norhisham, M. S. Yahya, S. N. Atikah, J. Syari, O. Bach, Mona McCord, J. Howes, and B. Azha. (2024). Non-crop plant beds can improve arthropod diversity, including beneficial insects in chemical-free oil palm agroecosystems. Article ID: OAFA (2367383).

References

i. *Mexzón, R.G. and Chinchilla, C.M. (1999) Plant species attractive to beneficial entomofauna in oil palm (Elaeis guineensis Jacq.) plantations in Costa Rica. ASD Oil Palm Papers (Costa Rica) No.19 (pp. 23-29)
ii. MPOB (2016) Standard Operating Procedure (SOP) Guidelines for Bagworm Control. Malaysian Palm Oil Board, Bangi. 41 pp.
iii. Sustainable Agriculture Network (SAN) 's IPM Resources include presentations relevant to the SAN-Ferrero project.

SALCRA SAFEGUARDS BIODIVERSITY THROUGH HCV ASSESSMENTS

SALCRA is committed to adopting sustainability practices and has introduced another initiative, the High Conservation Value (HCV) Assessment, to identify and protect significant environmental areas that align with the MSPO Certification requirements.

THE Sarawak Land Consolidation and Rehabilitation Authority (SALCRA) is a statutory body dedicated to transforming idle Native Customary Rights (NCR) land into productive oil palm plantations to improve the landowners' socioeconomic status. As of 30th September 2024, SALCRA manages 20 estates covering over 55,000 hectares, benefitting more than 20,000 landowners across 400 longhouses and villages in Sarawak.

In addition to its commitment to economic development, SALCRA has recognised the growing need for environmental preservation. Since 2010, the Authority has incorporated sustainable practices into its operations, aiming to reduce carbon emissions, conserve water resources, promote biodiversity, and enhance soil health, ensuring a balance between progress and environmental stewardship for future generations.

Camera trapping installation, a part of the biodiversity assessment activity.

What is HCV?

One of SALCRA's key initiatives in this sustainability approach is the High Conservation Value (HCV) Assessment, which is crucial in identifying and protecting areas of significant ecological, social, or cultural importance. This initiative aligns with the requirements of Malaysian Sustainable Palm Oil (MSPO) Certification (MS2530:2022). To date, SALCRA has conducted three (3) HCV assessments.

HCV Process/Steps

So, how are these assessments conducted? The process begins with a comprehensive review of existing data and literature to understand the area's ecological and cultural features. However, this relies not solely on historical information; field surveys are also conducted to gather fresh data on biodiversity, habitat conditions, and other crucial indicators.

SALCRA officers engaging the local communities.

The second component of the assessment is local community engagement. How is the HCV concept introduced to the residents? Through interactive presentations, videos, and demonstrations, the residents are encouraged to share their invaluable local knowledge. Their insights are crucial to help navigate the significant area and ensure precise data collection.

The third component of the assessment is further enriched through expert collaborations. For example, the Malaysian Palm Oil Board (MPOB) provides essential data from bird and insect surveys. At the same time, Universiti Malaysia Sarawak (UNIMAS) uses trail cameras to monitor wildlife around the oil palm concession.

The World Wildlife Fund (WWF-Malaysia) has also been giving support by providing training related to HCV. These expert collaborations enhance knowledge transfer and provide better preparation for the implementation of the HCV assessment.

The HCV assessment supports effective conservation and sustainable practices by combining insights from local communities with scientific expertise. This approach ensures a comprehensive and impactful evaluation, balancing today's needs with environmental conservation.

A wild boar and pitcher plant (an endangered plant species in Malaysia) seen during the biodiversity assessment activity.

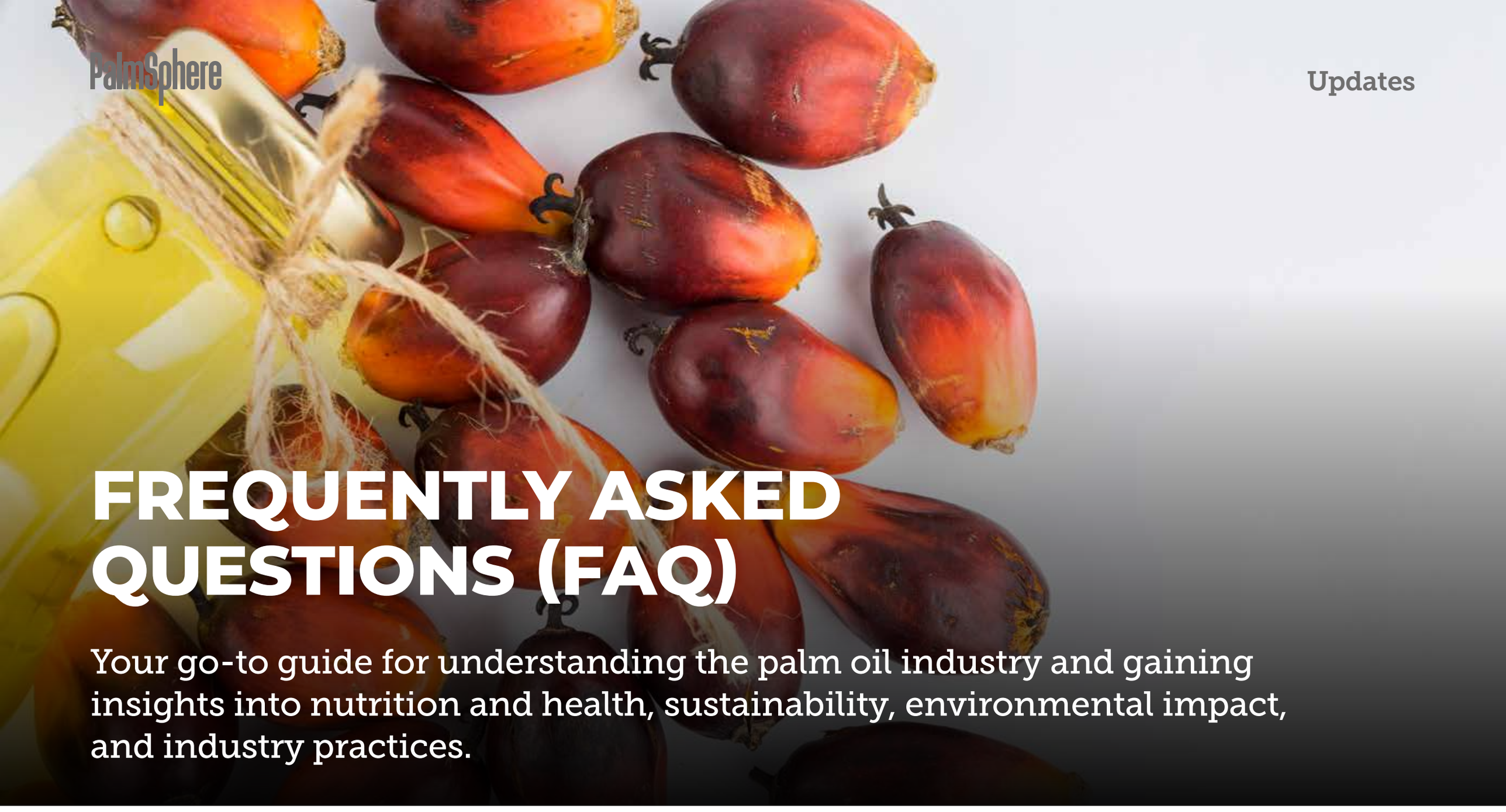
Key Finding and Impacts

The assessment identified a significant presence of wildlife adjacent to the oil palm concession, highlighting the need for targeted conservation efforts. This shows that the findings gained from the HCV assessment are significant in shaping SALCRA's conservation strategies. For example, an immediate action that has been taken is the rehabilitation of the Riparian Zone through an extensive tree-planting programme.

In June 2024, SALCRA collaborated with WWF Malaysia and the local community of Stengin, Lubok Antu, to conduct a second tree planting programme at the Lemanak Oil Palm Estate, and more than 900 fruit trees and timber trees were planted during the two-day programme. Recognising the increasing need for Riparian Zone rehabilitation, SALCRA is committed to extending the programme to all estates.

The second tree planting programme, in collaboration with WWF Malaysia and the local community of Rh. Stengin.

These initiatives help effectively meet urgent environmental needs. By integrating these findings into the broader conservation framework, SALCRA aims to enhance ecosystem resilience, safeguard cultural heritage, and promote sustainable practices.



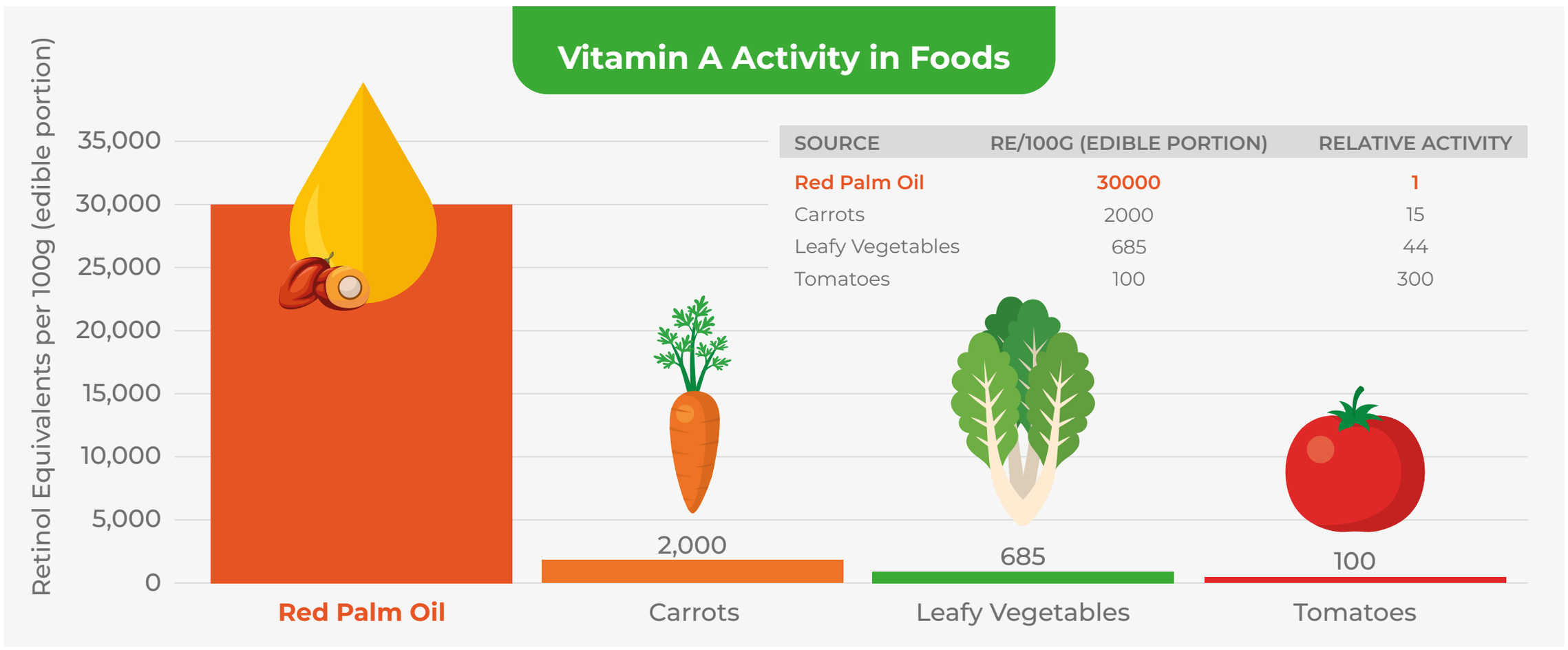
FREQUENTLY ASKED QUESTIONS (FAQ)

Your go-to guide for understanding the palm oil industry and gaining insights into nutrition and health, sustainability, environmental impact, and industry practices.

QUESTION:

Why is Red Palm Oil a superfood for health?

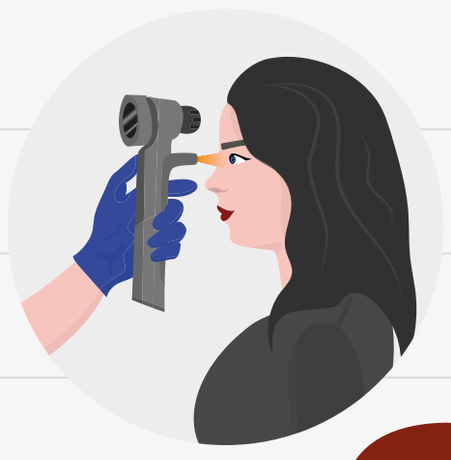
RED Palm Oil is packed with carotenoids, which the body converts into vitamin A, an essential nutrient. Just two teaspoons (10 ml) daily can fulfil your recommended daily intake of 600 micrograms of retinol equivalent. Consuming this nutrient helps to combat vitamin A deficiency that may cause blindness, growth delays, and greater susceptibility to infections.



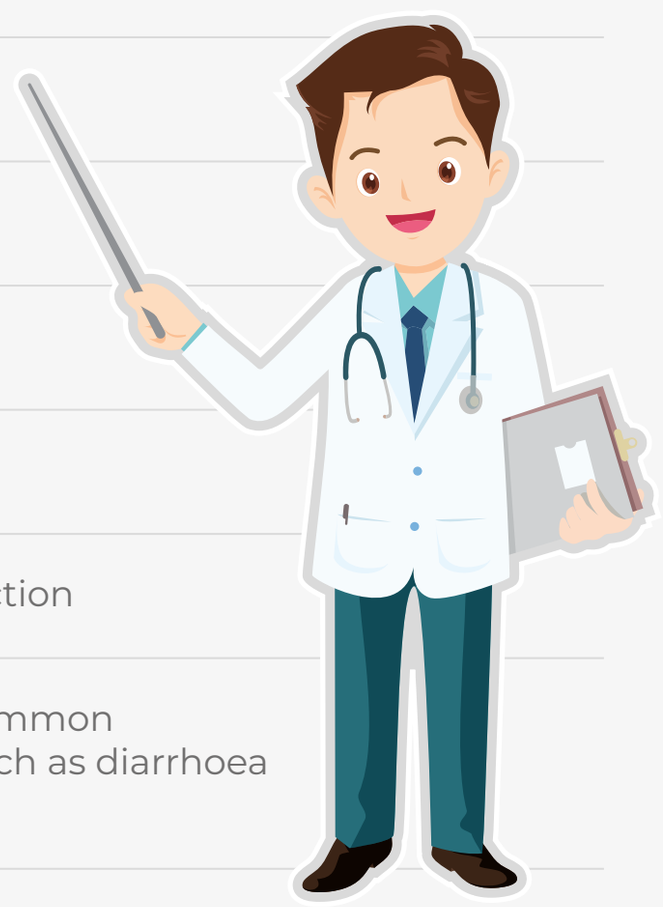
SOURCE	RE/100G (EDIBLE PORTION)	RELATIVE ACTIVITY
Red Palm Oil	30000	1
Carrots	2000	15
Leafy Vegetables	685	44
Tomatoes	100	300

Carotenoids Powerhouse: Red Palm Oil is a leading source of provitamin A carotenoids among everyday foods, containing 600-750 parts per million (ppm). It also has the highest vitamin A activity (30,000 retinol equivalent (RE), making it extremely effective for conversion into active vitamin A by the body. This is 15 times more than in carrots (2,000 RE), 44 times more than in leafy vegetables (685 RE), and 300x more than in tomatoes (100 RE).

Symptoms of Vitamin A Deficiency



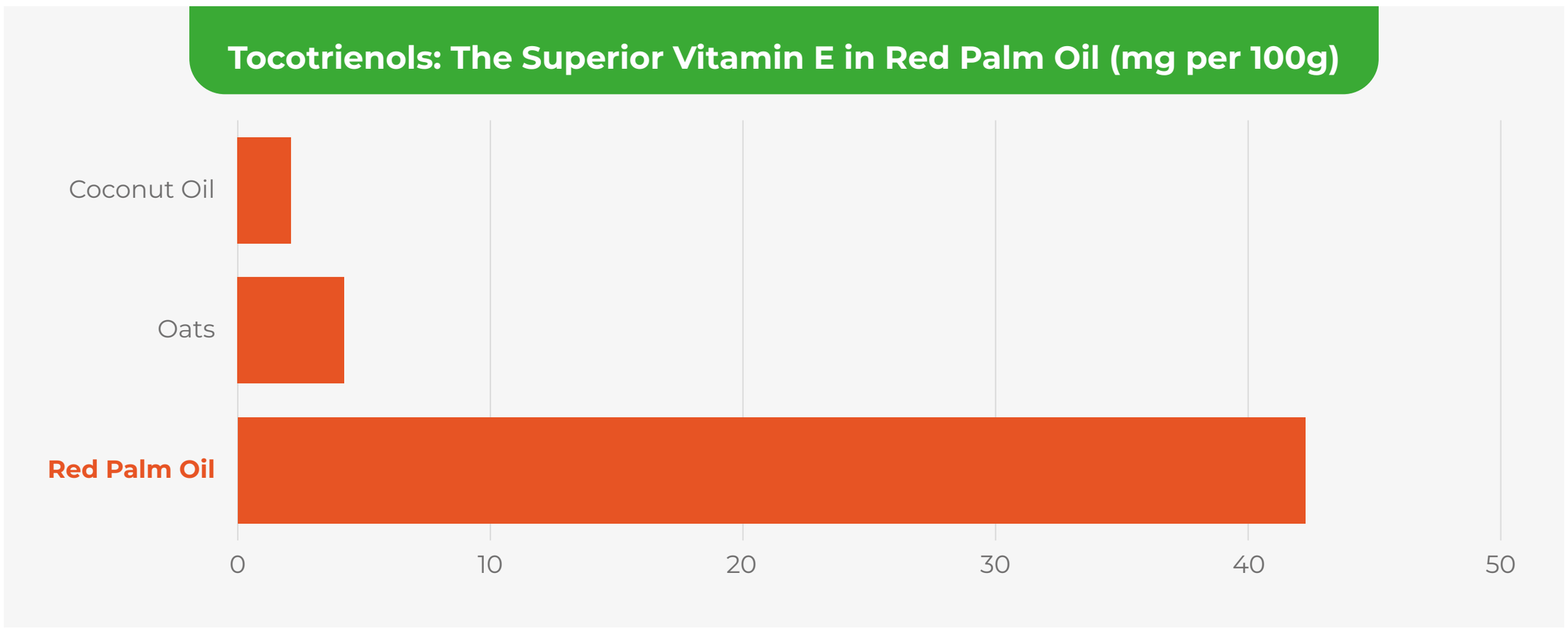
1. Visual impairment
2. Blindness
3. Stunting
4. Anaemia
5. Respiratory disease
6. Increased risk of infection
7. Mortality owing to common childhood infections such as diarrhoea and measles



QUESTION:

What makes tocotrienols in Red Palm Oil so special?

Tocotrienols, a unique and potent form of vitamin E, are abundant in Red Palm Oil. These compounds are 40–60 times more effective as antioxidants than tocopherols (the common form of vitamin E). They boost immunity and play a role in preventing chronic illnesses and maintaining overall health. Additionally, Red Palm Oil offers other beneficial nutrients like Squalene, Coenzyme Q10, and plant sterols.



Tocotrienol Levels in Red Palm Oil: A comparative look at how Red Palm Oil surpasses other sources like oats and coconut oil.

Key Benefits of Tocotrienols:

- Brain health and protection against neurodegenerative diseases
- Potent antioxidant and anti-cancer properties
- Supports heart health by reducing cholesterol levels
- Enhances skin health by minimising wrinkles and scars
- Improves liver function and helps manage non-alcoholic fatty liver disease

MPOC - EUDR Resource Hub

THE Malaysian Palm Oil Council (MPOC) is proud to announce the launch of its dedicated European Union Deforestation Regulation (EUDR) resource hub, accompanied by an insightful explainer video. These initiatives are part of MPOC's commitment to keeping stakeholders informed about the evolving regulatory landscape and supporting the Malaysian palm oil industry in navigating the challenges posed by EUDR.

Stay Informed, Stay Compliant: Explore MPOC's EUDR Resource Hub

The EUDR resource page is a one-stop resource centre for anyone seeking to understand the EUDR and its implications for Malaysia.

With a user-friendly interface, this platform provides concise and helpful information tailored to the needs of the Malaysian palm oil industry and other stakeholders:

- **Overview of EUDR:** Gain a clear understanding of the regulation, its objectives, and its scope.
- **Impact Analysis:** Discover how EUDR affects Malaysia and its palm oil industry, including potential challenges and opportunities.
- **Compliance Strategies:** Access valuable insights and guidance on how the Malaysian palm oil industry is adapting to meet EUDR requirements.
- **References and Updates:** Stay informed with the latest news, reports, and official updates related to EUDR.

EUDR Video: Informing and Engaging Stakeholders

MPOC's explainer video serves as an engaging introduction to the EUDR and its potential impacts on Malaysia, thus highlighting:

- **What is EUDR?** A clear explanation of the regulation, its goals and its requirements.
- **Implications for Malaysia:** How EUDR could affect Malaysia's palm oil exports and the broader economy.
- **Malaysia's Initiatives:** Highlighting the proactive measures taken by Malaysia and MPOC to facilitate the Malaysian palm oil industry's compliance with the EUDR, including the recognition of the MSPO certification scheme by the EU and Malaysia's designation as a low-risk country under the EUDR's country benchmarking system.

For more information,
visit the EUDR Resource Hub and watch the EUDR video

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