

# SUSTAINABILITY JOURNAL



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Dear Reader

Social issues in the palm oil industry have been cast in the sustainability spotlight in the past one year. The focus on sustainability issues has shifted from environmental to social elements such as welfare of children and labour rights.

We provide a glimpse of children's lives in plantations and how they are meaningfully engaged in school, ("Ensuring education access for children in the plantations", p2-3).

In our efforts to green the supply chain, we deem it important to involve smallholders in a constructive way. We speak with our new General Manager of Smallholder Programmes and Projects, Mr Robert Nicholls, who will provide some insight on our new smallholder programmes, ("Building trust with smallholders", p5).

Our efforts in engaging local communities are extended via an outreach programme customised for women in North Sumatra, ("Going beyond agronomy to tackle health and nutrition", p4). We also share on what we are doing to help local communities deal with the issue of fire, ("Fire-Free Village Programme: Within and beyond concession boundary", p6-7) and ("Combating the use of fire through composting", p8-9).

Last but not least, a small article on the big benefits of MCT Oil, ("Medium Chain Triglycerides - An unexpected health booster", p10-11) completes this edition of our Sustainability Journal.

I hope you'll enjoy reading these stories. 

*Bachlin Karim*

Executive Chairman  
Musim Mas Group



# Ensuring education access for children in the plantations

Fitri Marsiam looks on with pride as her three children are doing their homework. The 28-year-old mother is pleased that they are doing well in school. "I think studying is important so that they can have more options in life when they grow up because I won't be around to take care of them forever." says Fitri, who works in Sukajadi Sawit Mekar (SSM) estate as a weeder.

Her three children, Indi, 10, Widya, 6, and Said, 5, attend the primary school and kindergarten located at SSM's Sebabi estate, Kotawaringin Timur, Telawang, Central Kalimantan Province, six days a week.

Musim Mas has built schools through the Anwar Karim Foundation to provide equal education opportunities for children living in and around plantations. It also deems it important to provide quality education, starting with qualified and experienced teachers. The school curriculum is based on a syllabus approved by the education ministry, in collaboration with government officers to adopt guidelines on the latest developments. Our schools have been awarded the 'Best School in the District' accolade, an affirmation of the good quality of the schools.

Based on the UNICEF statistics on Primary Education (2008-2012), the net primary school participation rate averages 99%, net attendance ratio stands at 91.05%. In addition to the participation and attendance rates, ensuring that children remain in school until graduation is important as primary education provides the foundation to prepare for the skills required in the future such as linguistics, mathematics and science. The survival rate to last primary grade for Indonesia stands merely at 88%.

As part of holistic education, all students attend computer classes. They also develop other skills through extracurricular activities apart from core lessons. For example, Indi goes for traditional dancing classes for two hours every day after




Fitri (second from right) with her family. Her eldest daughter, Indi is seated in the middle.

classes. She is also one of the best students in her school, having won the mathematics competition at the regency level, and will subsequently be competing at the provincial level. To prepare for the competition, she is given special mathematics classes. Our schools have been regularly winning awards in the inter-school competitions in science, mathematics and sports.

The United Nations Convention advocates the rights of children to be protected from economic exploitation and be given education as the pathway to improved livelihoods and social mobility, as well as access to nutrition, amongst others. Likewise, Musim Mas understands that it needs to provide a conducive environment for growth and nurturing of the children in its plantations.

During the day, young children whose parents are working at SSM are placed at the Childcare Centres - a social infrastructure that is critical in remote areas such as plantations where families have limited alternatives. Each estate has a Childcare Centre and its services are available to the workers for free.

Workers can go to work with peace of mind, knowing that their children are in a healthy and nurturing environment that takes care of their formative years' developmental needs. At ages five or six, the children start their formal education at a kindergarten.

Ensuring that the children of its workers are given access to education is an important part of Musim Mas' sustainability agenda. The company believes the children in the plantations are entitled to regular childhoods, and to have dreams and aspirations like any other children in Indonesia. "Last month, Indi told me that she wants to be a teacher when she grows up", reveals Fitri, her eyes beaming with joy. 

The company believes the children in the plantations are entitled to regular childhoods, and to have dreams and aspirations like any other children in Indonesia.



# Going beyond agronomy to tackle health and nutrition

Despite Indonesia's impressive economic growth, acute malnutrition is a prevalent public health issue across Indonesia, with some places more severely affected than others. Stunting occurs frequently among children and iron deficiency anemia is common among women of reproductive age. In a recent report released by the National Team for the Acceleration of Poverty Reduction (TNP2K) on 9 August 2017, Indonesia scores low in comparison with 47 countries including Angola, Burkina Faso, Ghana, Haiti, Malawi, Nepal and Timor-Leste.

The 2013 Basic Health Research (*Riskesdas*) by the Indonesian Health Ministry recorded that about 37 percent of Indonesian children were stunted, and more than 20 percent women of reproductive age were malnourished. Inter-regional disparities (both within and outside Java, and between urban and rural areas) are still significant and have persisted over time.

The cognitive abilities and future educational development of a stunted child are adversely affected. They usually go on to earn low wages and become entrapped in a cycle of poverty and low social mobility.

The Indonesian government first launched a nation-wide campaign in 2000, based on the then Millennium Development Goals (currently Sustainable Development Goals) of eliminating poverty and hunger, reducing child mortality and improving maternal health. Local governments worked to socialise food and nutrition topics to women and children, to create awareness on the importance of healthy diets.

The children of Musim Mas Plantation workers start their formal education at kindergartens when they reach five or six years old. They are provided free meals which usually consist of eggs, milk, and vegetables while in school, to make sure they have access to good nutrition and a balanced diet. Children under five years old living in the company area are also distributed free additional food through the integrated family planning service centre, *Pos Pelayanan Keluarga Berencana - Kesehatan Terpadu (Posyandu)*.

Additionally, the company has an idle land allocation scheme in the plantations for the workers' to cultivate as food gardens on which fruits and vegetables can be planted to supplement their diets. These initiatives are implemented to address the issue of malnutrition and vitamin deficiency.


Beyond its plantations, Musim Mas is working with the International Finance Corporation (IFC), a member of the World Bank Group, to address the issue through the joint work on the Indonesian Palm Oil Development Scheme

(IPODS). A scoping survey was conducted on women in Rantau Prapat, North Sumatra on the awareness and knowledge level regarding food and nutrition aspects. The results of the survey demonstrated a requirement for raising awareness and improving knowledge on food nutrition. Hence, the women were invited to participate in the health and nutrition training since culturally in Indonesia, they handle the marketing and cooking for their families and are an invaluable source of social capital.

The curriculum was designed based on the knowledge gaps identified in the scoping survey. Speakers who are experts in the identified areas of needs were invited to speak at the programme. The participants were also introduced to the food pyramid - a widely recognised nutrition education diagram, which illustrates the optimal proportions of each food group to achieve a balanced diet. The well-known tagline in Indonesia of "*Empat Sehat Lima Sempurna*" which literally translates into "Four Healthy Five Perfect," was reiterated. This tagline makes it easy for participants to remember the importance of including the four food types of carbohydrates (rice), protein (meat), vegetables and fruits in their meals, with dairy products like milk as being perfect. And it also known as "*Gizi Seimbang* (Balanced Nutrition)." The IPODS team also shared on healthier cooking methods and habits such as the use of less oil, salt, and sugar. The training included expectant women, focusing on sharing food and nutritional information vital for antenatal health management.

Similar to the food gardens in the Musim Mas estates, participants were encouraged to grow vegetables and fruits with shorter gestation periods in their home yard and gardens so that these could be consumed more frequently as a balance to the typical carbohydrate-heavy dietary habits of most Indonesians.

To-date, about 1,150 women from Rantau Prapat have participated in the health and nutrition training. Many stated that they have started adopting the healthier practices. One of the participants, Ibu Yani, 35 years old, who had become a strong advocate of balanced diets among her friends, commented, "This programme has helped me understand what is good for my family. My husband likes to eat rice and meat, so I usually cook those so that he is full after working the entire day. Now I cook more vegetables, and add fruits when I can as these are important for my three children especially the youngest one who is not even five years old because these provide vitamins and nutrients to make them healthier."

Musim Mas and IFC are looking to replicate this educational outreach programme to the other villages. 

# Building trust with smallholders



To create positive impact on the ground for smallholders requires the rigorous examination of the fundamental challenges faced by them in their day-to-day life. Our Extension Services Programme (ESP) is designed to do just that.

Smallholders contribute about 40% to the palm oil production in Indonesia. With the sheer number of smallholders ranging in the millions, the Extension Services Programme (ESP) was conceived to reach out to a complex web of independent smallholders efficiently and enabling the transformation of the industry. It is designed to assist the smallholders supplying the Group's third-party suppliers with knowledge of Good Agricultural Practices (GAP), and other Best Management Practices and sustainability criteria which are increasingly important for their continued access to the global market.

We speak with Robert Nicholls, our new General Manager of Smallholders Programmes and Projects, who will be spearheading our ESP initiatives.

**Welcome to Musim Mas, Robert. Tell us more about yourself.**

I have been working in the industry for many years and have worked in several different locations in Kalimantan and Papua in estate operations and new developments. My last posting was to Papua New Guinea (PNG) as Regional General Manager. My background is in agricultural trainings and have previously set up training programs as well as competency standards for different companies in the industry. Each site I worked at had schemed smallholder (KKPA) blocks and involved a lot of communication with the local community. For instance, I ran a site with approximately 1,000 smallholders in PNG. It was an important interface between the company and the local community.

**Could you share more about the Extension Services Programme, your vision for it as well as your role in this?**

The programme is about working with the independent smallholders of our third-party suppliers. It is all about deepening and enhancing the partnership with these groups of stakeholders. I will oversee the implementation of the ESP for smallholders in the third-party supply chain.

**Where will this programme be implemented? Why was this region/ area selected to kick-start the programme?**

We have analysed our supplier traceability findings and examined the risk profiles of key regions we source from. Additionally, based on upcoming scoping studies, we will select the region for implementing the project. A lot of background work has been done to set the programme for success.

**Why does Musim Mas want to launch a project that benefits smallholders who are supplying our third-party suppliers? Isn't this group a little far off from our own supply chain?**

For an industry leader like Musim Mas to simply focus on its own operations and the management of its direct supplying farmers is no longer sufficient these days. In the course of our engagement with suppliers, we found out that some may wish to include and manage their indirect farmers too, but do not have the necessary tools to do so, while some may not know how to operate a farmer extension model. Some suppliers may not even realise that the condition of their farms and smallholder farms can be improved until someone comes along and helps with surveys and informs them about the possible improvements. So if we have a tested system, why not pass it along, share the knowledge with everyone to manage their own smallholder extension, so that everyone has inclusive systems making it a win-win for everyone.

**We understand that you recently visited Rantau Prapat in North Sumatra, where Musim Mas is running a parallel smallholder project with the International Finance Corporation (IFC). Any learning points which would be instrumental to the success of ESP?**

Commitment and patience are essential for meaningful relationships to be developed as demonstrated in Rantau Prapat. It takes time to fully engage the community and gain their trust. The success that has been gained so far also demonstrates that it pays dividends to develop strong positive relations with stakeholders through teamwork and partnership. It was evident from the way the ground team interacted amongst themselves.

**Could you provide a glimpse into the programme curriculum?**

The programme will be needs-based and will vary for each region. There will be a heavy focus on Good Agricultural Practices to assist smallholders to improve their yields. Environmental issues will also be addressed. A whole range of other topics will be considered for implementation as the unique needs of smallholders from different regions surface and become more apparent. It is possible that topics such as financial literacy, gender inclusion and management will also be included.


**Based on your experience, any foreseeable problems with the implementation of the programme? And how do you intend to overcome these problems?**

The biggest challenge I foresee will be developing a trusting relationship with smallholders and other stakeholders.

**How would the success of the programme be measured? Because if we are talking about sustainability, it can be rather hard to quantify things like adopting good agricultural practices right?**

Measurement will be difficult to quantify in some cases. However improved yields and quality of FFB can be measured over time. Some outcomes will require time due to the duration required for certain agricultural practices to have an impact. Positive feedback from smallholders will be one gauge, as well as the willingness for smallholders to participate in the programmes offered. Certain environmental issues will be evident and can be traced, such as the use of chemicals, fire free land clearing practices etc.

**Any plans to replicate and scale up to other regions?**

Initial plans will be to establish ESP in one region first then as the programme experiences success and momentum, we will look to other regions that are important to Musim Mas. 





## Fire-Free Village Programme: Within and beyond concession boundary

As a company operating in many regions in Indonesia, Musim Mas is taking a pro-active approach in helping local communities eliminate the use of fire and prevent its occurrence. Fire data collated from various sources, including the World Resources Institute (WRI), highlights the need for local communities to be further engaged and assisted upon to overcome constraints which prevent them from eliminating the use of fires.

Musim Mas has been running its Fire Free Village Programme (FFVP) also known as *Masyarakat Bebas Api* (MBA) in many regions in Indonesia. Since 2016, the Group has signed Memorandum of Understanding (MoU) with 70 villages covering more than 500,000 hectares - double the Group's concession area.

MBA is designed holistically to overcome the challenges of communicating to stop the use of fire for land preparation. Firstly, the Group raises the awareness on the importance of a fire-free environment and the methods of opening land without burning. Agronomic Best Practices and training are provided to the villagers. The *Muspika* and *Muspida* (village government/regency/BPBD, Army, Police and related departments) are involved in increasing awareness on the negative impact of clearing land through the use of fire. To create a conducive atmosphere, villagers are invited to attend events with food and music in a relaxing setting. These events raise awareness on implications of the use of fire and the potential complications. When fires go out of hand, it can create haze which impacts human health. Letter of appeal for the community to not use fire are sent regularly to the villagers. Signages are erected to serve as reminders.

In order to implement a holistic programme, Musim Mas engages the village heads and villagers to discuss fire

prevention, reporting and suppression methods. The focus is on fire training to the community, early detection of fire using drones and CCTVs.

The company also provides the participating villages with fire-fighting and monitoring resources to work together on prevention. These include fire extinguishers, portable water tanks, farm tractors, excavators, and bulldozers.

A notable component of MBA is the reward given to villages for successfully preventing fires during the MoU period. Each village that remains fire-free for the stipulated period will receive rewards which can be used for building or repairing community infrastructures.

The main reason for using fires to clear land is usually economic as it is costly to the rural communities to purchase machines, given that slash and burn techniques have historically been used for shifting cultivation. Traditional agricultural wisdom deems burning as a way to improve the fertility of the soil. To clear land mechanically is expensive and therefore assistance would be required for land ascertained of its development legality. Musim Mas established MoUs with the village heads to provide heavy equipment required for mechanical clearance where possible.

To further help local communities manage the waste from land clearance, the Group is working with Riau University on composting stacking waste into fertilisers (see "Combating the use of fire through composting", p8-9).

In 2016 alone, the Group invested IDR 26 billion (USD 2 million) in fire monitoring and suppression, including the cost of the FFVP *Masyarakat Bebas Api* programme and the erection of fire watch towers and purchase of excavators, etc.

### Sumatra



Awarded by Company:  
**PT Musim Mas**  
**PT Guntung Idamannusa**

Company	PT Musim Mas	PT Guntung Idamannusa
Rewarded Village	Pangkalan Lesung	Tanjung Simpang
	Talau	Surabaya Mandiri
	Pesaguan	Bantaian
	Betung	Sepakat Jaya
	Tanjung Beringin	Lahang Hulu
	Batang Kulim	Teluk Merbau
		Belanta Raya

General Affairs personnel of PT Musim Mas, Peron Sembiring, stated that socialisation is regularly held by PT Musim Mas as part of the company's commitment to prevent land and forest fires. These sessions also involve stakeholders, including the community around the company's operations.

### Kalimantan



Socialisation by Company:  
**PT Sukajadi Sawit Mekar**  
**PT Maju Aneka Sawit**  
**PT Globalindo Alam Perkasa**  
**PT Unggul Lestari**



New MoU signed with  
**19 villages**

Company	PT MAS	PT GAP	PT UL	PT MPG	PT HAL	PT SEC	PT MI	PT LAP	PT MP
Rewarded Village	Hanjilipan	Kandan	Tumbang Balai	Makunjung	Limbo Sari	Sumber Harapan	Lumbang	Pengatapian	Beringin Raya
	Tangar	Simpur	Tumbang Kalang		Sel Rahayu I	Sabung	Semangau		Tumbang Titi
	Boampah		Tumbang Manya		Beringin Raya	Beringin	Madak		
			Tumbang Sepayang		Darat Nuli	Mekar Jaya			
			Sungai Hanyu			Tengguli			

The Head of Emergency and Logistics Division of the Kotawaringin Timur Regional Disaster Management Agency, Sutoyo commented that Musim Mas has been very active in assisting the local government with preventing and overcoming land forest fires.

"During this time, Musim Mas has helped our community, and now, the company has provided rewards which will motivate people to prevent forest and land fires better," said Pak Sutimin, Head of the Kotabesi sub-district.

The Musim Mas fire control crew undertake daily fire monitoring, three kilometres beyond the concession boundaries. They act upon first sign of detection and report to headquarters which would inform the Roundtable on Sustainable Palm Oil (RSPO) in a timely manner. Musim Mas also conducts fire drills within its concession and with neighbouring communities. Since the earlier part of this year, the Group has stationed a helicopter with a 500-litre bucket capacity in Central Kalimantan on standby for putting out fires.

As an enhancement to our fire monitoring system, the Group piloted an early fire detection system atop a signaling tower in collaboration with a leading telecommunications company. The system, which is perched at a vantage point of 70 metres above ground, uses a high resolution camera with thermal sensory capabilities that provides 360-degree rotational detection with a five-kilometer coverage. Upon detection of a hotspot, the system issues an alert that prompts action from the ground crew. The fire alert system will be implemented across all Musim Mas operations if assessed to be successful in aiding fire monitoring.

The work that had been done beyond Musim Mas concession boundaries include local communities in Central and West Kalimantan, Riau and West Sumatra. The Group has participated in at least eight fire-fighting efforts to-date this year. For

example, the fire-fighting team from the Group's subsidiary, PT Agrowiratama, worked with the district government of Sungai Aur, the police and military of Lembah Melintang, and the National Disaster Agency of West Pasaman Regency to suppress and control the fire which occurred in July 2017 in Plasma Batang Alin Jorong Sakato Jaya, Kanagarian Sungai Aur Kab, Pasaman Barat Regency in West Sumatra, Indonesia.

Upon being alerted to the fire, personnel were first dispatched to join the local government authorities in assessing the fire such as its location, scale, site conditions and characteristics including its type and grade, to identify suitable fire-fighting strategy and determine personnel and equipment requirements. In this particular event, the conditions were difficult given the drought and low water level in the river. The team created trenches around the fire and used fire trucks. More than 24 fire-fighters worked long hours to stop the fire with the use of excavators and water pumps.

The Group believes that fire-fighting requires collaborative efforts between the public and private sector, as the socio-economic and environmental costs of fires are too high, for the public sector to tackle alone. The FFVP (*Masyarakat Bebas Api* programme) is commencing with its second year of implementation and the Group looks forward to further success in preventing fires.



# Combating the use of fire through composting

The use of fire for land clearance within Indonesia has been historically rooted as a traditional and cheap way for farmers to access their land. It has been widely discussed and has triggered an encouraging array of initiatives from different stakeholder groups to solve the issue. Musim Mas is of the belief that a paradigm shift by communities on the use of fire requires a solutions-based approach that is both practical in its implementation, and ensures at least minimal socio-economic disruptions to their livelihoods, if not benefits.

As an extension to the Group’s *Masyarakat Bebas Api* (MBA) programme implemented to holistically engage with nearby local communities on the issue of fire, Musim Mas is partnering with the University of Riau (UNRI) on a two-year project to explore the deepening of the solutions.

This collaboration includes providing training to local communities to improve land clearing techniques without using fire; conducting and developing knowledge on alternative organic waste management methods, inculcating the importance of maintaining the environment through zero-burning techniques in their farming efforts and everyday life, as well as socialising on the hazards of land fires and its wider environmental and socio-economic implications.

Musim Mas is working together with UNRI on a model of composting which can be adapted by communities. One of the reasons for land becoming more fire-prone is due to organic litter left in farms or scrub areas which are susceptible to catching fire. To avoid this, it is important that farmers are able to make use of easy techniques to manage organic waste. From this perspective, we believe that composting may provide a pathway for encouraging the non-use of fire.

A main aspect of the project involves sharing knowledge on composting to the local communities and ensuring that the know-how is retained amongst them for continued application beyond the completion of the project. Based on the availability of shrubbery and developmental plans, three villages near the Musim Mas concession in Pekanbaru (Riau), were selected to

participate in this project. In addition, these villages were also selected as a known fire-prone area lies within the vicinity of the villages.

The essence of the composting technique is the accelerated degradation of waste by microorganisms that results in the production of organic materials suited for the conditioning and fertilising of soil. UNRI has been working on the composting project for a significant period, and the knowledge being imparted to the local communities are based on well researched, tested and documented methodologies.

Working groups are formed in each village to undertake composting, and guidance on the process is provided by UNRI. The materials used are largely dependent on the types of waste available. This may include twigs and leaves or empty palm fruit bunches chopped to a size optimal for the decomposition process, aged manure to provide nutrients and conditioning of the soil, nitrogen fertiliser known as Urea, Triple Superphosphate (TSP) SP36 fertiliser, Dolomite (agricultural lime) to provide calcium and improve the pH of soil (alkaline), and fungi such as Trichoderma mushrooms introduced into the mix thereafter. Each composting process takes about four weeks, and if done properly should result in an organic fertiliser suited for application as a base, or routinely applied.

The completed compost mix, also termed ‘Triko fertiliser’ serves as a good substitute for chemical pesticides as well, and is rich in macro and micro nutrients. The active material of Trichoderma SP acts as a decomposer and biological pathogen control for land and seeds, aiding in increased crop productivity and contributing to the organic quality of vegetable and fruits grown.

Based on the research undertaken by UNRI, the application of organic fertiliser derived from empty palm fruit bunches and rice straw to three-month old oil palms can spur additional growth of approximately 48.68% in height, 21.4% in diameter, root canopy ratio of 30.22% and dry weight of root 49.23% (Andreas, M. Ali and M. Amrul, 2015).

In addition to the agronomic benefits of organic fertiliser application, composting also brings about two-fold benefits in environmental and socio-economic aspects. Externalities such as haze are eliminated because of the need for land clearance waste to be avail as a composting resource.

The reason for the use of fire by local communities for clearing land is its low cost from the use of gasoline which is only about IDR 6,500 (USD 0.48) per litre, compared to using mechanical clearing which uses heavy machineries. As such, to successfully encourage the shift away from the use of fire would require the identification of an impetus which is economically rooted.

While the capital requirements of composting in terms of the material requirements at IDR 2,015,000 (USD 149) for producing one tonne of Triko fertiliser may not be the most affordable compared to the use of fire, the emphasis in our socialisation with communities focuses on the concern that the use of fire for land clearance, leaves organic waste unavailable for composting, meaning that the communities’ crops would be unable to enjoy the agronomic benefits of the Triko fertiliser.

Additionally, the cost comparison between the use of chemical fertiliser and a mixture of organic and chemical fertiliser, further strengthens the economic reasons for a fire-free pathway.

Application	Cost of each application (per hectare)
Chemical Fertiliser	IDR 4,454,884.00 (USD 328.77)
Mixture of Organic Fertiliser and half dose of Chemical Fertiliser <small>(These are combined to meet the nutritional requirements of the oil palm tree crop)</small>	DR 3,143,865.00 (USD 232.01)
Cost Savings	<b>IDR 1,311,019.00 (USD 96.76) 29%</b>

Figures provided by the University of Riau (UNRI) for research purpose.

In addition, we also share that contrary to traditional wisdom, the use of fire consequentially damages soil as the essential organisms die from the combustion process and intense heat,

rendering soil conditions detrimental to the healthy growth and productivity of crops, thereby affecting yields and monetary returns to varying extents. These identified impetus then needs to be socialised with the local communities to create awareness on the downside and implications of using fire, not just to their health but also to critical resources, i.e. land on which their livelihood depends on.

In addition to the composting materials of which costs are borne by the Group, there is also a need for an enumerator to resize organic waste, and tarpaulins for sheltering the compost pile. These capital requirements are underwritten by Musim Mas, as the equipments are provided to the villages on a loan-basis.

Musim Mas looks forward to contributing to a growing pool of research and scientific literature, based on the collection and exchange of data and information from this collaboration with UNRI. The Group will monitor the success of the project based on indicators such as the achievement of a zero-burning outcome by the three villages through the above socio-economic trajectory. The success and replicability of this project can unlock solutions to the wider landscape challenges of fire and haze.🌱🌱







# Medium Chain Triglycerides

## - An unexpected health booster

There has been a wave of health conscious consumers who choose to avoid fats in their diets, but the simple fact is that human bodies require dietary fats to function. Dietary fats provide energy and keep bodies warm, support cell growth, protect organs, and aid in absorption of nutrients, and provide important hormones. In recent years, the Ketogenic diet trend which involves reducing the intake of carbohydrates and replacing with fats, has resulted in a niche market for Ketone-producing products such as Coconut and Palm Kernel oils which contain Medium Chain Triglycerides (MCT).

The saturated fat contents in Palm Oil has often been cited as a health concern in the past. Modern science has proven that the harmful effects of saturated fat has been overly inflated. Small wonder that coconut oil, the highest fat content vegetable oil in the world, has found popularity in modern day diets. Still, Palm Oil as the most efficiently produced vegetable oil, is the most widely used oil in the world. It's by-product, palm kernel oil, which closely resembles coconut oil, is also increasingly being used to replace coconut oil due to

its price competitiveness. One of such applications for palm kernel oil is in the production of Medium Chain Triglycerides (MCT).

As its name suggests, Medium Chain Triglyceride is structurally made up of six to twelve hydrocarbon chains, and is considered to be of medium length (as opposed to short or long chain Triglycerides ). Human breast milk which is deemed by the




World Health Organisation as the best form of nutrition for infants younger than six months, also contains MCT. Being colourless and odourless, the oil is palatable and easy to include into a regular diet. The consumption of MCT is said to provide a string of health benefits.

Firstly, MCT serves as an energy booster. It is passively diffused along the gastrointestinal tract into the liver, and is not dependent on enzymes for transportation into digestive cells that absorb and break down nutrients and create carbohydrate-like energy, providing an almost instant perk in energy levels and enhance alertness, linked with quicker post-exercise recovery. The absorption process of MCT improves metabolism as the fatty acid is not stored in human bodies as fat, and instead stimulates beta-Oxidation which burns fats.

MCT is also a good source of alternative brain fuel. The human brain is powered primarily by glucose. In a state of dietary carbohydrates deprivation, the liver organ becomes the sole provider of glucose, tapping on a back-up of ketone bodies derived from the fatty acids (MCT). These are released into

the bloodstream and consumed by the brain as "fuel". MCT also increases the number of mitochondria (energy factories) in brain cells, thereby overcoming the degeneration of hippocampal cells (part of the brain limbic system responsible for memory and emotional responses) which leads to cognitive dysfunction and loss of memory. With the increased brain cell energy reserves, it may be possible to ward off stressors of diseases that kills off cells. Hence, there has been an on-going discussion on the merits of MCT for people with neuro-degenerative diseases such as Alzheimer's and Parkinson's.

The growing popularity of consuming MCT oil can be attributed to the above health benefits. While so, the key to a healthy life still remains a balanced and moderated dietary habits. 

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Headquartered in Singapore, our business is involved with every part of the palm oil supply chain: From managing plantations and mills to refining crude palm oil and manufacturing palm-based products, supported by an extensive fleet of ship tankers and barges that enhances our logistical capabilities. We employ 37,000 employees in 13 countries across Asia Pacific, Europe, and the Americas, committed to meeting global demand for Palm oil and its derivative products in an environmentally, socially and economically viable manner.

This publication is produced by Musim Mas. Comments and suggestions are welcomed. Please contact the corporate communications team at [sustainability@musimmas.com](mailto:sustainability@musimmas.com) or visit our website at [www.musimmas.com](http://www.musimmas.com).