Positive Attributes of Coconut Oil Reinforced

The Oil Story of the past 75 Years

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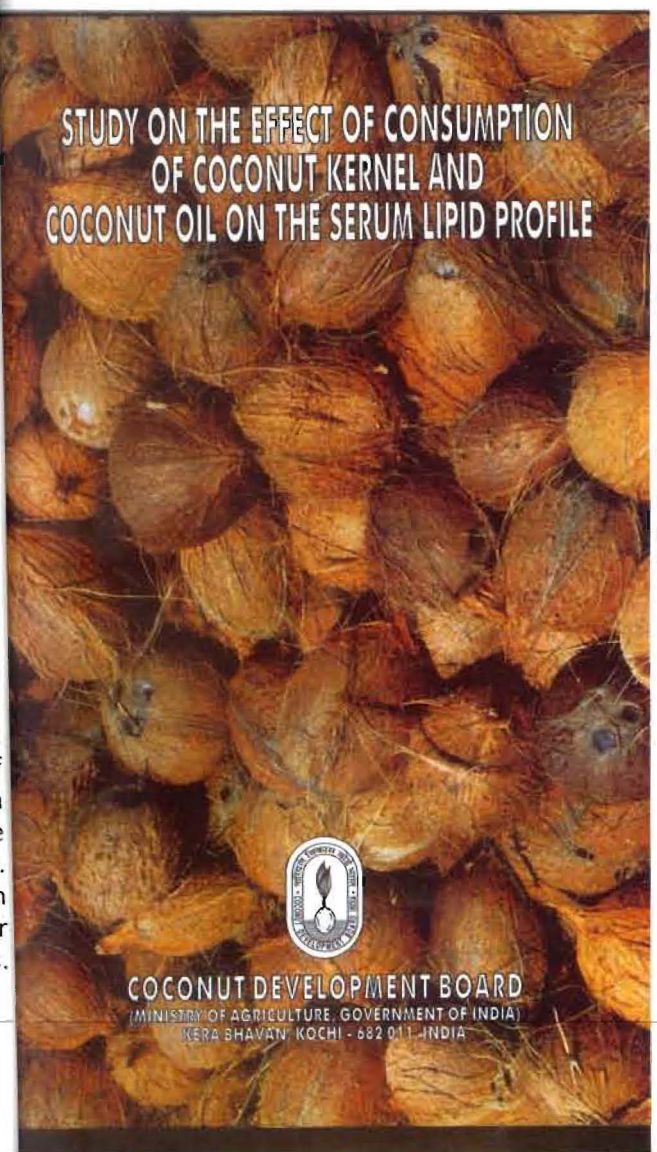
The health promoting attributes of coconut oil and those functional properties useful to the human beings were recognized from time immemorial. There is an estimation of nearly 4000 years in documenting the edible and healing properties of coconut products. One unique property of coconut oil is that it is equally good and in demand for both edible purposes and for industrial uses. Coconut and its products have many health and nutritional benefits including medicinal value. Coconut oil is a rich source of lauric acid (49 %) as well as Medium Chain Fatty Acids (MCFA) and hence exhibits antimicrobial, antiviral, antibacterial, antifungal and antiprotozoal properties and therefore its uses include as food and nutritional supplement with anti-obesity and anti-inflammatory actions, antibacterial and anti-viral agent, and as skin and hair care. Though the protein content of coconut kernel is only 4-4.5 %, it is richer in essential amino acid - lysine than in rice or other cereal. It also provides cardio protective amino acid arginine. Coconut oil is reportedly the safest frying oil than any other saturated fats. In spite of many advantages as edible oil, many misunderstanding and misconceptions have been crept in among the consumption sector cornering it at least for some periods, especially in 1980s and 90s. Recent evidences, however unleashed the truth that coconut oil is not harmful to health. Of late several other medicinal properties of coconut oil even in the management of Covid patients are emerging.

Coconut is heavy, oily, pacifies heat, sweet and cool. It improves musculature, maintains cardiovascular health, promotes growth and cleanses the urinary bladder.

The fresh kernel and dry meat are complete natural foods. The dry meat contains protein (7 %), carbohydrates (22 %) fibre (16 %) and oil (56%) (Fabian M Dayrit, 2022). The dietary fibre and protein content of coconut kernel exert positive influence on cholesterol mechanism as revealed in several studies conducted by Department of Biochemistry, University of Kerala. Coconut oil is rich in glycerin content and less sticky and hence very suitable for cosmetic industry. Dominance of coconut oil in skin protective medicines is very popular especially in Ayurveda preparations.

Major industrially exploited fatty acids present in coconut oil are lauric, capric, caprilic, myristic and palmitic acid. Fatty alcohols and glycerol are also industrially exploited components in areas like pharmaceuticals, detergents, cosmetics, toiletries and in personal care products. Lauric acid is converted to monolaurin and capric acid to monocarpin during digestion. These two are the monoglycerides which possess antiviral, antibacterial and antiprotozoal qualities and destroys the microbes in the body. In edible sector, one advantage of CNO is that it can be used without refining. Oil processed from quality copra or from wet kernel is used directly without any processing. Coconut oil retains the most suitable omega 6:3 fatty acid proportion in its natural form and protects certain carcinogenic chemical substances and help absorbs vitamins, mineral and amino acids. It also accelerates calcium absorption and strengthens the skeletal system. Coconut oil can be developed for many uses, from diet to functional food, to therapeutic applications. It is an important feed stock for the manufacture of various Oleo chemicals, called coco chemicals. Clinical trials have also reported that MCTs are converted to ketones in the liver and are served as alternate source of energy to brain cells. Coconut oil in oral cancer treatment gives hopes in medical sector. Ketogenic diet is also recommended for cancer patients.



This article intends to throw light on the results of research and clinical studies carried out within and outside India for the past seven and half decades. Study results during this period are exhaustive but only selected references, very relevant to our food habits and health condition are cited here. The published scientific data and extracts are taken as such, without any alteration.

Coconut oil–The Fatty acid profile

Coconut oil is made up of chains of C, H, & O2 called fatty acids. The length of carbon chain dictates its exceptional qualities and makes it different from other saturated fats. Coconut oil is chemically and functionally different from the rest of the saturated fats. The fatty acids in combination with glycerol are glycerides – Coconut oil is a triglyceride or lipid as it contains 3 fatty acids linked to a glycerol molecule. The term oil is used to lipids that are liquids at room temperature. The glycerol content in coconut oil is 13.5-15 % and is the highest among other oils except palm kernel oil.

These triglycerides and fatty acids form the basis for production of glycerol, methyl esters and fatty alcohols and downstream oleo chemicals from fatty acids/fatty alcohols. Therefore CNO form basic ingredient for the manufacture of many downstream products. CNO contains mainly 9 fatty acids. Seven saturated and two unsaturated. Saturated fats are caproic ($C_5H_{11}CO_2H$- C6) 0.4 %, caprylic ($C_7H_{15}CO_2H$-C8) 7.0%, Capric ($C_9H_{19}CO_2H$-C10) 6.3 %, lauric ($C_{11}H_{23}CO_2H$-C12) 49%, myristic ($C_{13}H_{27}CO_2H$-C14)19%, palmitic($C_{15}H_{31}CO_2H$-C16) 7.0% and stearic ($C_{17}H_{35}CO_2H$-C18) 2.0%. Oleic acid (C18:1 - mono-unsaturated long chain) 7.5 %, linoleic acids (C18:2 - Omega 6 long chain)1.8 % and Linolenic acid (C18:3 - Omega 3 long chain) 0.1 % are the unsaturated acids. As could be seen from the formulae, the major fatty acid is 12 carbon lauric acid (about 49 %) followed by 14 carbon myristic acid (19%). Thus the composition of medium chain saturated fat (C6-C12) is 63 %, long chain saturated fat (C14-C18) is 28 % and unsaturated fat (C18:1, 18:2 18:3) is 9.5 %. Despite the clear cut evidences on the important difference of Saturated Fatty Acids

in Coconut oil from 1960's, certain agencies like American Heart Association still continue the age old allegation and coconut oil is wrongly labeled as dangerous saturated fats. Because of the similarity in the chemical structures, saturated fats are often misinterpreted to possess the same biochemical and physiological properties. But this was not the truth. The decades from 1990 witnessed the revelation of real facts, through multipronged researches carried out in major coconut growing countries.

Coconut oil –An Oil with distinct differences

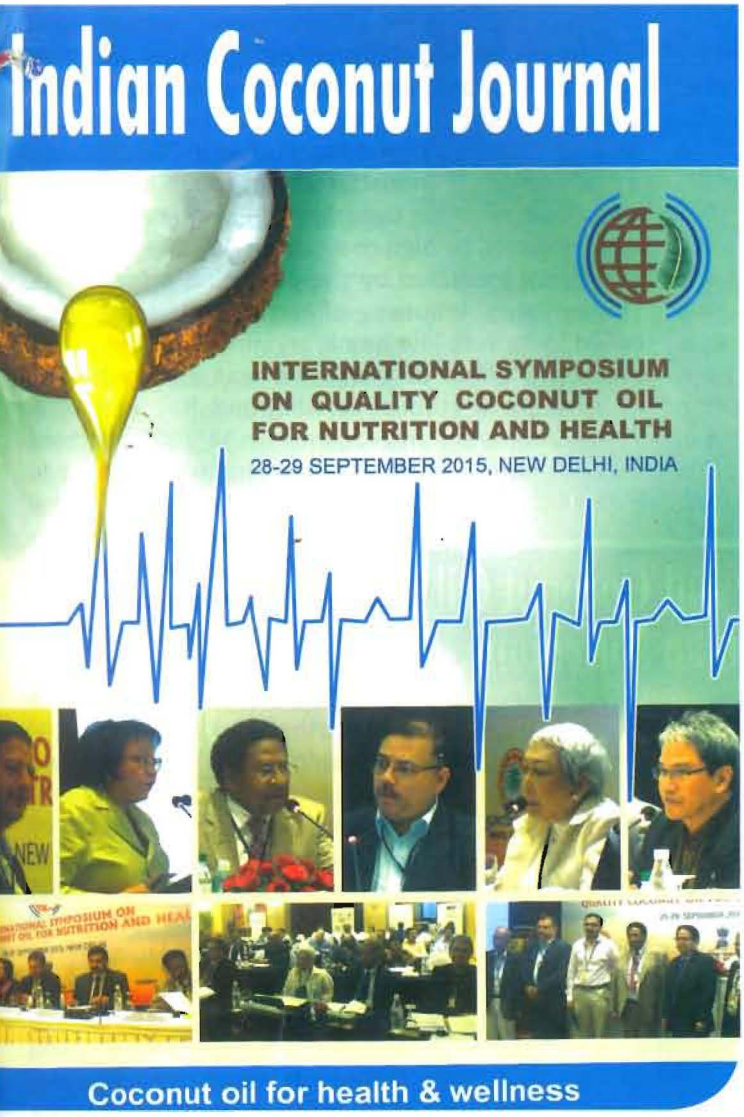
Coconut oil is categorized as a saturated fat due to its 91 % fatty acids in saturated form. But the saturated fat present in coconut oil is distinctly different from that of other saturated fats like animal fats. A content of C6 – C12 medium chain fatty acids makes coconut oil unique. Fatty acids present in CNO are saturated with no double bond, mono unsaturated fatty acid with one seat of double bonds and poly unsaturated fatty acids with 2 or more double bonds. The fatty acids with more double bonds are easier to oxidize and form free radicals and peroxide / aldehyde on heating. These compounds cause damage to cell membranes and may lead to inflammation, obesity, diabetes, cancer, Alzheimer's etc. Soybean oil and corn oil are highly unsaturated and easily oxidize whereas coconut oil due to its highly saturated nature is highly resistant to oxidation rancidity and comparatively healthy frying oil. It has the highest saponification value and lowest Iodine value. Low Iodine value renders it highly suitable for selected industrial application. It also has the maximum digestibility coefficient. It facilitates easy digestion and rapid absorption. The digestion of MCT starts in the mouth itself undergoes faster hydrolysis in the stomach and upper small intestine than the LCTs, without the involvement of pancreatic lipase and absorbed easily as fast as glucose. These are then secreted across the intestinal cells and are directly carried to portal circulation whereby undergo rapid oxidation into energy. LCTs undergo slow process of digestion with the help of pancreatic lipase. The products of hydrolysis are transported to liver via lymphatic and systemic circulation and therefore fatty acids are more likely to be deposited as fat than MCTs.It contains 91 % assimilable glycerides and it is an important fat source for milk powder and an essential ingredient in cream bars, ice cream, biscuit, and wafers, chocolate and creamers. In culinary preparations it retains stability and resistant to breakdown while reheating. This quality is not in unsaturated fats, as they produce toxic compounds in such processes.

Coconut oil is aphrodisiac, heavy, nourishes depleted tissues, pacifies heat and exhaustion and is useful in treating diseases like diabetes, asthma, cough, wasting and injuries.
(SaligramaNighantu)

The dietary nutrients are metabolized in the mitochondria of cell for energy production. The saturated fats and medium chain fats can permeate the double mitochondrial membranes easily. They are oxidized faster to CO2 with energy liberation. As a result, deposit of VLDL, in the liver is meager. In the case of long chain fatty acids carnitin transferase is needed to cross mitochondrial membranes. They are oxidized slowly and with the result, VLDL incorporation is high. These advantages of MCFAs are made use of in medicinal foods. In infants medium chains act favorably in the absorption of Ca, Mg, and amino acids. CNO has 2.56 % fewer calories per gram of fat compared to that of long chain fats. Thus CNO helps to cut down calories.

Hydrogenation of oils is resorted to prevent it from rancidity. Hydrogenation however, results in the formation of trans fats and therefore the high intake of transfats is cautioned.Coconut oil is not normally hydrogenated. Moreover coconut is mostly consumed in natural forms. Coconut oil contains small amount of antioxidants. But low content of unsaturated fatty acids prevents high LDL oxidation. Fractionation of coconut oil is for separating different fatty acids. Lauric acid is isolated for industrial and medicinal purposes. Similarly caprylic and capric acids which are medium chain triglycerides are isolated for medical applications, special diets and cosmetics.

It is concluded in P.K. Thampan's book viz., Facts and Fallacies that dietary fats perform many important physiological roles in human nutrition. But



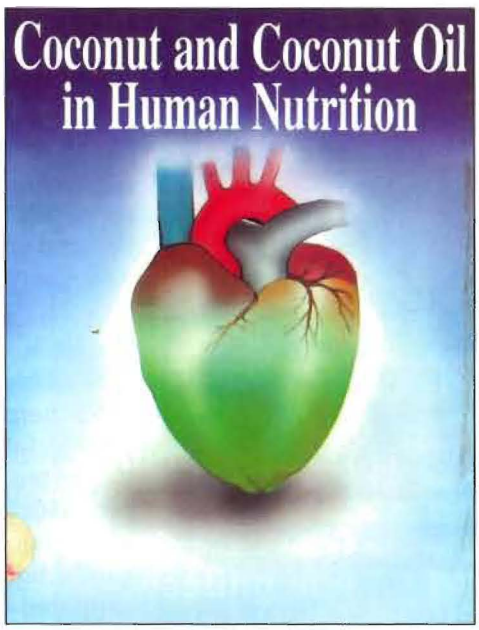
to limit the consumption of oils and fats to less than 30 per cent of the daily calorie intake. To avoid high intake of trans fats is equally important.

Coconut Oil Story- The Trajectory

Coconut oil was reportedly the main edible oil prior to World War II. When the War intensified, Coconut oil supply was interrupted and there occurred an increase in production of other vegetable oils like soybean, sunflower oil, corn etc. After the War it was felt necessary to keep the vegetable oil going and therefore the manufacturers of vegetable oil raised propaganda against coconut oil pinning on the saturated fat issue. They could convince the public that unsaturated oils are safer for health and thus the use of coconut oil became insignificant. Literature says Coconut oil requirement in the country in 1948 was estimated at 1.70 lakh MT whereas the production was 1.14 lakh MT. This demand supply gap was filled in by resorting to import (Coconut bulletin, 1950, 4 (4)). In 1930s when travelling to various Islands to study the relationship between urban and native diets, Dr. Weston A. Price identified coconut as staple diet and their primary food source. He noticed that natives consuming a diet of at least 60 % coconut had a better overall health and low rates of heart diseases and vice versa. He unraveled many medicinal properties of coconut oil from the experience of these Islanders. In 1945 Vanderbilt reported B complex vitamins like Niacin, Panthothenic acid, Bios ion, Riboflavin and folic acid in coconut kernel. Indian coconut oil, especially Kerala coconut oil was in great demand in those days in European countries when compared to oil from other places. Coconut oil was exported in larger quantities from India. Thereafter due to expansion of industries especially toiletries and cosmetics industries coupled with the population growth import was resorted to.

Even though coconut oil has many desirable and unique characteristics as edible oil, several misconception were perpetuated regarding its use as a dietary fat.Many of these misconceptions originated from the research findings of 1950s based on animal experiments, which had many drawbacks. Some studies conducted in USA in 1956 reported that saturated fats found in CNO are dangerous. Later on these findings proved to be biased and predisposed. Pollack, reported as early in 1952 that inhabitants of Thailand have low rate of heart attacks and strokes although coconut oil was their leading dietary fat. A Scientist viz., Ancel Key started a study in 1960 and its results set the link between saturated fats and cholesterol and Coronary Heart Disease (CHD). In 1961, American Heart Association (AHA) first declared that animal fats were saturated and similar to coconut oil. The physical property of solid nature of these two in cold temperature was one main reason for this wrong assessment. In 1969, Dr. Aman said coconut oil can be moderately used by high BP, diabetic and obese persons (Medicinal secrets of your foods, Indo American hospital, Mysore, p 815). In 1960s Medium Chain Triglyceride

(MCT), a new synthetic group of fats was developed. MCT oil was found useful for lipid disorders and for weight loss and was commercially available in mid 1960s(Harkins&Sarett, 1968). Since then MCT oil was in wider usage as special dietary oil and US FDA classified it as safe by labeling as GRAS (Generally Recognized As Safe).In every 15 ml coconut oil MCT is 8.4 g. The next closer is Palm kernel oil which is 8 g/15 ml. (USDA National Nutrient Database.www.ars.usda.gov/nutrient data). Some findings have pointed out that MCT is used in medicinal foods in infant feeding formulae where quick and high energy is needed for humans.Coconut and CNO consumption correlated negatively with cardiovascular deaths in Sri Lanka over a 45 years period from 1961 to 2006 where as CVD death rates correlated positively with per capita GDP.



Often coconut oil consumption and human death were wrongly correlated. The population studies of 1981 by Kaunitz in Sri Lanka revealed only one death out of 100,000 populations while the rate in the countries with little coconut oil consumption varies from 16 to 187. Moreover undesirable lipid changes were noticed when young male adults changed their normal diets by substituting coconut oil with corn oil. In 1995 Kurup and Rajamohan and Thomas and Mukkadan reported that consumption of coconut kernel alongwith coconut oil lowers serum total cholesterol, LDL cholesterol, and LDL/HDL ratio when compared to coconut oil alone. Thomas Paul and Mukkadan JK in 1995, after studying 100 patients with diagnosis of acute myocardial infarction, with special emphasis for dietary habits and critically examining cholesterol, lipids etc it was concluded that adequate proof was not available that coconut oil alters cholesterol level unfavorably or induce premature atherosclerosis. They suspected that there may be other factors involved which need to be rectified.

In 2001, Arranza presented a paper on the Dietary Symposium at Beijing on the topic "Nutritional milestone of coconut oil in Philippines". According to him coconut oil cures diseases of nervous and metabolic processes; it increases semen; and nourishes the body, promotes discharge of urine; cure tuberculosis; breathing troubles; cough and diabetes; sharpens intelligence and is effective in healing wounds. Sali and Rajamohan in 2001 through a study on rats demonstrated that coconut protein is effective in reducing hyperlipidemia and peroxidative effect induced by high cholesterol rich diet and these effects are mediated by the L-arginine present in it. The beneficial influence of kernel protein has been linked to its very low lysine/arginine ratio.The cardio protective effect of L-arginine was also reiterated in subsequent studies by Mini and Rajamohan, in 2002. Sindhurani and Rajamohan in 2003 reported coconut fibre as a natural hypocholesterolemic and hypoglycemic. In 2003, the antioxidant role of kernel and oil cake as well as their influence on bile acid and the bacterial enzymes was analyzed by Venugopal Menon *et al.* It was found that coconut cake and kernel feeding can reduce the severity of colorectal cancer. In 2009, Amrita Institute of Medical Sciences & Research Centre, Kochi had compared the lipid profile in 302 persons consuming coconut oil (152) and sunflower oil (150) for more than 2 years. Lipid profile was analyzed in 41 coconut oil consuming coronary artery disease patients and 35 sun flower oil consumers. Similarly 130 diabetes mellitus patients (69 CNO consuming and 61 sun flower oil consuming patients). There was no statistically significant difference in the total cholesterol, HDL/LDL in this population. No changes in plasma fatty acid composition in relation to dietary fat source were observed. In a study conducted by them in 2015, they had investigated the effects of Virgin coconut oil in diabetic regimen diet on fasting serum glucose, insulin, ketone and triglycerides concentrations, but no difference was observed in Body Mass Index (BMI), fasting serum glucose, insulin, ketone and triglyceride concentrations after integration of VCO in dietary regimen. Thus the medicinal and nutraceutical properties of CNO were getting exposed one after other through various studies carried out within and outside India.

Kabara in 1978, 1985 and in 2001 and Enig M in 1996 and 2001 reported that the monoglyceride monolaurin is the substance that keeps infant from getting viral, bacterial, or protozoal infections, the very similar protection they get from mothers' milk. In 1994. Sree Chitra Tirunal Institute of Medical Sciences, TVM conducted a study on coconut oil and incidence of CAD in Kerala involving 552 CAD patients and 463 controls. No significant difference was observed in the mean levels of cholesterol between exclusive coconut oil consumers and mixed oil consumers. Still triglyceride level was lower in exclusive coconut oil users. Habitual consumption of coconut oil had no adverse effect on lipid metabolism leading to CAD. The study revealed that cholesterol level itself is not always an accurate predictor of CAD. But CAD patients have otherwise possessed high Triglyceride and low HDL lipoprotein levels. Antioxidant defense was also insufficient in such persons. And also hypercholesterolemia could not be identified as a prominent risk factor for CAD, in their study. Reports from Polynesia, Sri Lanka and Philippines also point out that CNO when taken as a part of normal diet has no linkage with the increased level of cholesterol and the incidence of heart diseases. Famous endocrinologists favor consumption of coconut oil by diabetic and heart patients due to the low content of omega – 6. study by the Philippines Council for Health Research and Development revealed the low impact of coconut oil consumption and CAD. While Philippines percentage of dietary calories from coconut oil was 6, their heart attack mortality was 22 out of one lakh. In USA it is respectively less than one and 227. In 1978 UN Demographic Year Book revealed that the death rate due to heart disease in Sri Lanka where coconut is the predominant dietary fat, is one out of one lakh. Among Nicobar Islanders also the results were the same.

In 2017 CDB team encountered a Medical Practitioner at Kochi, Kerala Dr. Sreekumar, who is heralding an establishment viz., Wellness Solutions which functions with the principle of preventive health. It disseminates the idea of safe guarding the body from being afflicted by diseases rather than consulting doctors as patients of chronic diseases. They advise the terminal patients who approach the Doctors as a Centre of solace, to include maximum coconut and coconut products in their routine diet. According to Dr. Sreekumar, coconut can be safely positioned to maintain health and wellness through safe food. How it works in the body? There is lot of toxins in our body. The residual effects of the poisonous food we take results in chronic disorders. Toxins are in our cells of liver, kidneys etc. Coconut products got amazing effects of detoxification of cells. Rapid digestive capacity of coconut oil has been already proved. In Alzheimers' patients memory is lost due to damage of cells. Coconut oil when given to such patients the cell wall gets strengthened. When cell wall gets strengthened energy production also get triggered and accelerated. To a question on virgin coconut oil, Dr. Sreekumar responded: Rejuvenation of cells takes place when virgin coconut oil is administered to a patient. Ketone bodies and polyphenols in VCO have identified as key salutary factors. Virgin coconut oil when consumed in natural form without heating brings wonderful result. For making cell walls stronger good fat is required. When fat is heated its goodness is lost. When VCO is heated its chemical composition gets disturbed and the qualities altered. From natural food, cell life is increased, health is improved, cellular process gets corrected and microbes get eliminated. Nevin and Rajamohan reported in 2003 that VCO obtained from wet processing was found to have lipid lowering effect and it is more beneficial than copra oil since it retains most of the minor components in the active

form which makes a potential hypolipidimic anti peroxidative agent. Thus the unique properties of VCO justify by all means its consideration as a functional food. In cancer treatment, coconut is used in many ways. For sustaining our life, food with life is required. Coconut products have life even after processing, he added. Western countries run detoxification centers with coconut. Just like coconut oil preserves pickles for longer period without contamination it preserves our body from being attacked by external factors. He expressed happiness over the fact that coconut fruit is coming out of the entangled misconception about its consumption. Scientific studies and clinical research throw immense light on every aspect of the medicinal and nutritive values of this wonder fruit.

In 2019 Department of Cardiology, Amrita Institute of Medical Science and Technology, Kochi also conducted study on consumption of VCO by humans. They studied the effect of VCO on Lipid Profile and other Cardio Vascular Disease risk factors. The study conducted in heart patients and the control groups had brought out no difference in the lipid profile which acts as a risk factor. At the same time there was significant increase in the good Cholesterol (HDL) level. But there was no increase in the bad Cholesterol (LDL). Earlier reports indicate that phytochemicals are comparatively more in VCO than in ordinary CNO. VCO has immense use in dietary supplement, salad oil, food ingredient, skin and hair care and many other applications.

Research of Bruce Fife(2019)revealed that age related eye disorders can be prevented and possibly even reversed. He suggested incorporating coconut oil in the daily diet of every one.

Intervention by Coconut Development Board

In 1990s the campaign maligning coconut oil as injurious to health crossed all limits. This was due to business interest of some lobbies of other vegetable oil manufacturers. They could create scare among some sections of traditional consumers. Following the confusion and embarrassment, scientific and research studies were conducted in many countries including India under the mandate of Coconut Development Board to understand the effect of coconut oil on human health. The results were very encouraging. They have not only disproved the wrong contents but also confirmed the beneficial features of coconut oil as dietary fat. The Board had undertaken aggressive measures to wipe out the misconception on coconut oil, viz. series of seminars/workshops/ fairs/and melas focusing on the same topic. Besides, aggressive media plan and publicity campaign involving debates, TV telecast/ AIR broadcast, hoardings, electronic displays, Railway announcements etc formed a part of the routine development activities. In 1994, for the first time in the history, a symposium on Coconut and Coconut oil in Human Nutrition was organized in India. Eminent speakers from all disciplines of allopathy viz., cardiology, diabectology, endocrinology, and biochemists, dieticians, food technicians' experts from Ayurveda, naturopathy, and homeopathy presented papers and shared experiences and valuable research findings. Recommendations of those gatherings paved way for commencing new researches and clinical studies by eminent medical institutions like Amrita Institute of Medical Sciences and Research Centre, Kochi which brought out many positive results favoring coconut oil and VCO on human health.

Coconut oil in Covid 19 Management – A New Hope?

Covid-19, the Corona Virus Disease pandemic slathered fiery memories the world over by the end of 2019 and continued its impact for more than two years. The WHO declared a global emergency over the Corona virus that had spread worldwide. A disease which was devoid of any perfect control measure landed the world population in a state of uncertainty and embarrassment. Prophylactic vaccines first, second and third shots were evolved but all these were not foolproof remedy for this disease condition.

In the world over, 66.90 lakhs deaths were reported, whereas it was 5.30 lakhs in India, a really alarming figure. World Bank recently released an estimate that world over 71 million people have become poverty stricken due to Covid-19, out of that 79 % ie., 56 million are in India. Several variants of corona virus viz., Alpha, Omicron, Delta and many more were subsequently emerged. Of late a subvariant of Omicron –BF.7 is in the news. Before this Omicron variants BA.2, BA.4, BA.5, BA 2.75, BA 4.6 etc., have also created concern. This surge is likely to reverberate globally. Public was in the midst of confusion, apprehension and finally in a state of helplessness. Reports also brought out, most populated countries are badly affected; but China was once behind India and less affected. But it is an irony that after three years of the pandemic China is seeing a resurgence of Covid and the lock down

situation put the country in a state of agitation and dissent from citizens than never before.

Paracetamol Dolo tablets recommended for the common cold is the only solution to mitigate the pandemic. In India 350 billion Dolo-650 were reportedly sold during the pandemic. If these could stack up vertically it would be nearly 6000 times as tall as the Mount Everest, the World's highest mountain or about 63000 the height of Burj Khalifa, the world's tallest building located in Dubai.

In this context, a news item appeared in the media on a Chocolate, named 'Corona Guard Chocolate' has attracted many. Pune Interactive Research School for Health affairs claim that this Chocolate is effective in defending Covid-19. Chennai Frontier Medivilla Hospital completed their technical trial. This chocolate is 98.4 % effective according to hospital CEO Dr. K. M. Cherian. Dr. Cherian added that there is no need of any permission from Drug Controller, as there is no side effect and it can be eaten as ordinary chocolate.

Virus Coating disintegration theory

What is there in this Chocolate? It is interesting that the basic ingredient of this chocolate is a special blending of coconut oil and castor oil. In Covid protocol, hand washing using soap (made of oil) assumes priority. While washing with soap, the outer cover of Corona virus disintegrates. The same principle is used in this Chocolate as well, it was reported. When the oil membrane in the Chocolate remainsin the throat, virus coating gets disintegrated and the virus destroyed. The positive effect of Corona Guard Chocolate remains 10-12 hours and hence the result is guaranteed. Chocolate will be available in the market in this year itself, according to Dr. K.M. Cheriyan.

Virus envelope disintegration with the action of MCFA or monolaurin was reported earlier by several scientists. Hierholzer & Kabara in1982 showed that monolaurin was able to reduce infectivity of 14 human RNA and DNA enveloped viruses in cell culture by >99.9% and that monolaurin acted by disintegration of the virus envelope. Thormar and co-workers (1987) confirmed the ability of lauric acid and monolaurin to inactivate viruses by disintegration of the cell membrane. The MCFA and their derivatives disrupt lipid membranes of the organisms (Isaacs, et al 1992), particularly enveloped viruses are inactivated.

There are similar findings recently published relating to the effect of coconut oil in Covid treatment. A study led by the Philippines Department of Science and Technology (DOST) in 2021 revealed that suspected Covid-19 patients administered with Virgin Coconut Oil (VCO) had expressed reduced symptoms and a faster recovery phase compared to control group. The study was conducted by the Food & Nutrition Research Institute (FNRI) at DOST. The patients who were given VCO expressed only mild Covid symptoms when compared to control group and they became disease free earlier than the control group. The Food & Nutrition Centre of DOST had presented this study result virtually. Vitamins C and E are important physiological antioxidants and help in protecting the body against excessive free radical damage. The disease fighting nature of VCO were the likely mechanism worked favorably in reducing the disease symptoms according to the project leader Dr. Angeles Agdeppa. Lauric acid and Monolaurin have the power of destroying the virus coating. Monolaurin is a metabolite that is naturally produced by the body's own enzymes upon intake of coconut oil. Besides, it prevents the binding of viral proteins to the host cell membrane. The hospitalization period of the disease suspected patients also could be reportedly reduced. However VCO is not recommended as a complete cure for Covid; but it helps reduce the aggravation of the

disease condition. The study was not done on Covid-19 patients with a higher viral load and more severe symptoms; but only on suspected Covid-19 patients. Three mechanisms have been proposed to explain the antiviral activity of lauric acid and monolaurin: first, they cause disintegration of the virus envelope; second, they can inhibit late maturation stage in the virus replicative cycle; and third, they can prevent the binding of viral proteins to the host cell membrane.

In a published study results, lauric acid in coconut oil killed over 93 % of human colon cancer cells after 48 hours of treatment. In HIV/Aids patients too similar results while administering VCO could be seen. The anti-viral ability of the lauric acid and capric acid in VCO could destruct the lipid capsule layer of virus more effectively than long chain fatty acids like oleic and linoleic acids. Manila Bulletin (2020) reported that a study is on to assess whether certain coconut oil components can diminish or prevent the infectivity of SARS-Cov-2, the causative virus of Covid. They also propose to conduct a study that aims to determine the transmission pattern of Covid-19 to help prevent its further spread and to craft policies for the containment and prevention of Covid-19.Dayrit and Newport in 2022 proposed three mechanisms to explain the antiviral activity of lauric acid and monolaurin. First they cause disintegration of the virus envelop, second they inhibit late maturation stage in the virus replicate cycle and third they can prevent the binding of viral protein to the host cell membrane. They even recommend the VCO be considered as a general prophylactic against viral and microbial infection.

Quality is Everyone's Responsibility

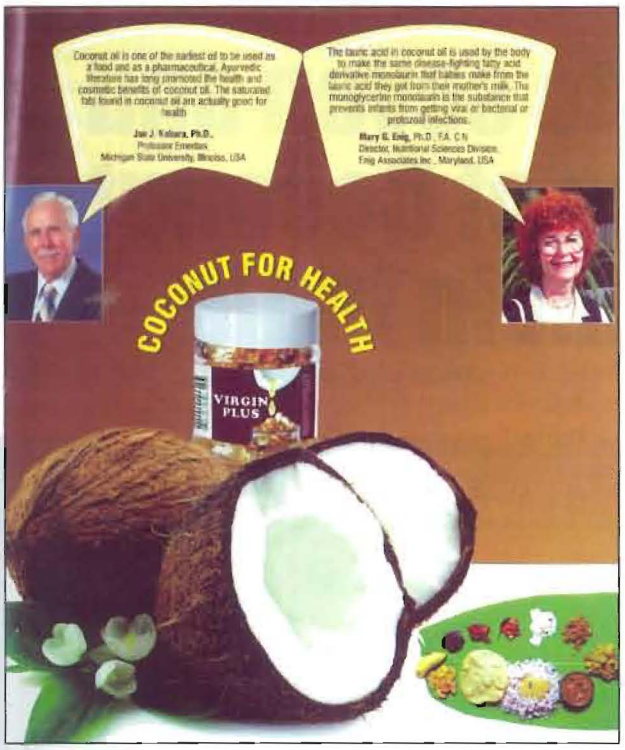
The positive attributes of CNO narrated at length are manifested only when it is consumed in its natural form. Mixed, adulterated or chemically processed oil fail to give its properties per se. Different brands in unnatural form reach the wholesalers and retailers in attractive labeling. The danger behind this is unknown to the public. Adulteration with cheaper oils is not the only problem, but mixing fats of animal source is also a practice. This is common when CNO price remain at a higher level. The mafia behind the scene is very complex and dangerous and the practice is widely spread in State like Kerala where coconut oil consumption is very popular. Such spurious oils are easily available in plenty at cheaper rates to road side vendors, fast food sellers and small hotels. Sales in tanker lorries take place mostly at odd time. This oil is used for frying mouth tickling beef fry, chicken fry and for frying onion pakoda, banana fry, capsicum and other hot served snacks which are common with the evening tea which stimulate our taste buds. While the young generation is racing behind these junk foods and fried items parents are not so strict enough to control this habit but often enjoy the taste of these hot snacks. A study is on the anvil among the youngsters of north Kerala which revealed provisional data about the alarming higher rate of intestinal cancers. Detailed report as and when published would throw more light.

To whom and how we can educate the public about these antisocial actions? There is no control over the unlimited flow of branded oils banned by Food Safety authorities. The banned brands are not disappearing permanently from the markets. They reappear in other brands in new names. In this scenario, who will plead for the common man's health? No body, we have to find answer ourselves.

To conclude, I put the following points to ponder:

- Bestow priority on the quality other than any other attributes
- Select food items carefully according to our age and body nature
- Take caution to use only unadulterated pure edible oils for cooking.
- Avoid excess oils and fats in dietary habits and limit trans fats
- Different oils and fats have different properties, try to include them alternatively in dietary preparations in their pure forms

Thus, let us realize the medicinal and nutritional properties of coconut oil, an oil very correctly and aptly referred as the King of Vegetable oil, which safeguarded our grandparents and great grandparents for centuries. The antibacterial and antimicrobial characteristic of coconut oil is inherent. The presence of lauric acid is the most favorable factor. One thing is guaranteed, coconut oil is unique and its positive attributes are getting reinforced day by day. If properly formulated and utilized coconut oil may be the preferred vegetable oil in diets and special hospital foods used for promoting patients recovery (Dayritet al 2001). Replacing the fats in the food with coconut oil may be the wisest decision one can make to lose excess body fat. Obesity being a grave issue of the present time in children and youngsters, this specific quality of coconut oil may be of immense help in curbing obesity. Coconut will be strongly in the lime light as the Super Food of tomorrow, as is being defended by scientific world.



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