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# COCONUT OIL FOR HEALTH IN A GLOBAL CONTEXT: PAST, PRESENT AND FUTURE

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## Infroduction

The coconut species first found a niche on the strand of countless tropical islands and larger land-masses many millions of years ago thanks to its sea-going seed (Harries 1978). The kernel or endosperm contained an abundant supply of energy to support the growth of the coconut seedling once the seed had been cast ashore onto a suitable niche on a distant strand, secure above the reach of daily tidal fluctuations. As members of the human species developed their own seagoing skills upon leaving Africa their ability to colonise tropical coasts was very likely greatly assisted by the bounty of the solid and liquid nourishment they could harvest from the coconut palms which had long established themselves along the way.

The “wild” coconut fruit, so successful in surviving for months while being carried by ocean currents and prevailing winds to distant shores, was modified by the colonising human tribes to yield more edible kernel, and to provide a larger water container for their own long voyages. The kernel, readily accessible to the itinerant visitor, was both palatable and nutritious, and a very fortunate energy source to accompany edible fish harvested from the ocean nearby.

As diverse peoples developed permanent settlements on coconut coasts, adopting the kernel and water as staples in their diet, they selected larger seeds for regeneration of palm groves. Over millenia this selection pressure resulted in



much larger fruit with a higher proportion of kernel and greater volume for water, becoming a more efficient “package” of food and water for voyaging near or far.

The Polynesian people, who colonised many islands in the Pacific in relatively recent times, were able to plant large fruit not consumed on the voyage on their new home islands. This gave rise to palm populations bearing fruit that are quite distinct from those more closely related to the descendants of the original wild population, such as on Rennell, Rotuma and Kar Kar islands.

When European mariners first travelled into the Pacific they encountered thriving communities on many islands and tropical coasts in which the people were robust and war-like, yet their diet comprised limited variety other than coconut kernel and fish. It was clear that the coconut provided a great source of energy food while sustaining great good

health. Most sea captains, such as James Cook who mapped the east coast of Australia, hastened to take supplies of coconuts on board to supplement their own limited and often deficient diets.

## Coconut oil for health in the recent past

The milk derived daily in the kitchens of the tropical world from the coconut kernel by shredding and extraction was added to dishes of every kind for nutrition and enhanced flavour. Coconut oil for frying was extracted from the milk by boiling, and it was this oil that got the attention of European traders when the demand for edible oil, and oil for soap-making, rose in Europe and the USA in the late 19<sup>th</sup> century.

The human population in those places had increased rapidly, and along with the urbanisation that accompanied the industrial revolution there was a shortage of supply of the traditional

animal sources of edible fats and oils (lipids). Coconut oil was embraced confidently for frying and as shortening in the West as it did not carry the health risk that was associated with some sources of animal fat in that era.

Once the popularity of coconut oil, imported at first from tropical market places, resulted in high demand and a rising price, investors in Europe turned to the development of coconut plantations. From the 1890s to the 1920s many hundreds of thousands of hectares of “copra” plantations were established in a colonial context throughout the entire tropical world from the Pacific islands through Asia, Africa and the Caribbean. The supply of coconut oil to meet global demand was highly profitable for decades. Consumers in the west were enjoying the same benefits to health that were traditional in the regions of origin of this popular oil.

The second world war brought about radical change in supply as trade in coconut was interrupted. Coconut oil had established an appetite for a “safe” lipid from a plant source so the market turned to alternative sources of which there were many. This was to deliver an almost fatal blow to the acceptance of coconut oil once trade resumed, because the suppliers of alternatives, in particular soybean oil in the United States, took advantage of confusion about the effect of particular types of lipid on health to oust coconut oil from that market. Many other countries followed suit though the arguments supporting this action were not universally accepted.

The weapon used against coconut oil was the Saturated Fat Hypothesis, developed in an atmosphere of anxiety over the health of the US president during



the 1950s. The physician Ancel Keys presented selected data from seven countries in the World Health Organisation “country” database showing an association between dietary fat consumption and heart disease. High serum cholesterol was also associated with heart disease, and because total serum cholesterol rose when the diet was high in saturated fat, the conclusion was drawn that saturated fat was a primary cause of heart disease.

The soy producers, who had gained a great market-share when coconut oil had been unavailable, during the war years, noted that coconut oil was a saturated fat. The American Soybean Association systematically ousted coconut oil from the market on the basis of this argument in spite of the high standing of coconut oil in healthy diets throughout the tropics and without a shred of clinical evidence to show that coconut oil in the diet was linked to heart disease.

#### **The present status of coconut oil**

Millions of dollars and many

research reputations have been invested for decades in the controversy generated by the saturated fat hypothesis. The policy against coconut oil and all lipids with a significant proportion of saturated fatty acids remains in place to this day. Medical practitioners and dieticians, trained in the era of “certainty” about the heart risk of saturated fat, remain unmoved. However, signs of uncertainty among some are beginning to appear, as a result of a massive body of evidence exonerating saturate lipids from a primary role in heart disease.

Supporters of the Saturated Fat Hypothesis (SFH) demand proof that coconut oil is not a risk to health, but the funding of a huge clinical study by coconut producers and processors is beyond their resources. The real question is, why should coconut oil wait for such a study when there is no proof that it is a risk to health. In fact, the body of evidence from many very large population studies points to saturated fat in general having been completely misrepresented.

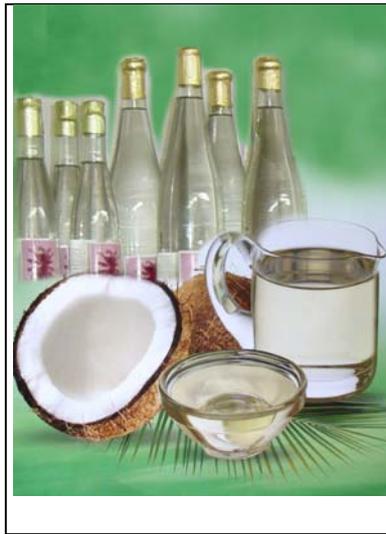
One example of a failure to prove the Saturated Fat Hypothesis is the Women's Health Initiative study in the 1990s in the US in which 48,000 women were divided into two groups consuming either an "average" or a low fat diet. Those whose consumption was reduced by more than 20% of both total fat and saturated fat showed no advantage during a period of ten years, in the incidence of breast, colorectal, endometrial or ovarian cancers, or stroke, or heart disease. The evidence from several other studies is equally unresponsive of the saturated fat hypothesis. In spite of this policy makers in the health and diet communities remain un-moved, expressing only irritation that such reports continue to be published.

Leading psychological researchers from the University of California, San Francisco have written, in relation to the issue of acceptance of new theories over old:

*"In scientific work we find that new theories are understood only by the graduate students, whose intellectual identities are then wholly transformed. In contrast, the senior professors are burdened with such connective inertia that when they encounter new ideas there is no apparent effect, other than an occasional vague irritation."*

Examples of just this sort of response, by guardians of the existing policy of avoiding saturated fat in the diet took place when I referred, in correspondence with a senior policy adviser in UK, to a review by Lawrence (2013), the book by Teicholz (2014) and an article in the journal *Open Heart* by DiNicolantonio (2013).

### The future of coconut oil



A number of "game changers" have entered the arena of the engagement of coconut oil with the food market. Although refined coconut oil had experience popularity in the West for frying and use as shortening in the early 20<sup>th</sup> century, the attack of the unsaturated oil advocates has been extremely successful in reducing demand. Refined Coconut Oil (RCO) had not been readily available and was also relatively expensive compared to other frying oils. There was need for a new element to transform the image of coconut oil so that consumer awareness, acceptance and eventually enthusiasm would be generated for its use. The primary game changer eventually came in the form of Virgin Coconut Oil (VCO), a product which had not been subjected, during its extraction, to high temperature and exposure to intermediate storage. The dried kernel of coconut, known as copra that was usually stored and transported to an industrial destination, yielded oil that requiring refining (RCO).

The market has embraced VCO, an oil produced from fresh mature nuts by three more-or-less equivalent processes which avoid high temperature. A traditional method of leaving fresh coconut milk, extracted from shredded

kernel, for up to 48 hours, results in the spontaneous separation of the oil into a separate layer floating on the aqueous substrate, from which it is readily separated. A recently perfected method of separation employs the centrifuge to separate the oil in the same way that cream is separated from dairy milk. Thirdly, there are two versions of a method of pressing the oil from desiccated forms of shredded kernel. One requires the application of high pressure to extract the oil from traditional Desiccated Coconut (DC) of very low water content (below 5%) and this method includes cooling to avoid a pressure-induced sharp rise in temperature. The other pressure method takes advantage of the release at low pressure of oil from desiccated coconut at a water content of 10 to 12%. The choice of method depends upon the scale of operation, the quantity of resource readily available, and the capacity of the local situation to attract investment.

While in some situations manufacturers of (DC) and coconut milk and cream have met the demand of a significant market for many decades, there has also been, in many regions, a large coconut resource languishing in a state of under-utilisation. Copra production had continued but the return-for-effort to the farmers and tenants was insufficient to stimulate conversion of all available fruit into copra. As a result there has been no interest in replanting, even though most palms are quite ancient, with low productivity. For many producers and advisers coconut was seen as a "sunset" industry, so that alternatives were being sought.

VCO has changed the outlook, generating a pace of increase in demand which anticipates a gradual switch of available resource from copra to VCO

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wherever investment capital is forthcoming. Replanting in order to expand the production resource in the most favourable situations, for increased VCO output, is already on the agenda.

It is not completely clear what is driving the increased demand for VCO beyond the general observation that those who include it in their regular diet report an increase in their general well-being. Publications such as *Coconut Cures* (Fife 2009) catalogue very many case histories reporting a large number of different conditions such as Irritable Bowel Syndrome and many skin ailments which have been relieved by including VCO in the diet or applying it topically. There are also reports of relief from symptoms of dementia (Newport 2011) and Type 2 Diabetes (Turner et al 2009) and a connection in each of these reports to the active ketogenesis of VCO, opening up an area for future research to clarify the precise mechanism behind responses involving ketones. There is also evidence of relief of symptoms and reduction of virus load HIV AIDS when coconut oil is administered (Dayrit and Dayrit 2013) although this study awaits a follow-up using a larger sample size.

The second game changer is the publication in 2014 of a remarkable book -*The Big Fat Surprise* (Teicholz 2014) – a thoroughly researched account of how the SFH came into being and how it gave rise to controversial health policies, initially in the United States, but spreading far beyond through agencies such as the World Health Organisation. It is clear from this account that a policy of aversion to fat, particularly saturated fat, was promoted by the medical researcher Ancel Keys in the 1950s based on a selected data set. Through his

position as the personal physician to the US President Keys enjoyed great public support while grasping every available opportunity to protect his adopted policy and to dismiss the many efforts of other researchers to present an alternative hypothesis. The SFH was eagerly supported by the soybean industry as it opened the door to their product to be used wherever a food lipid was needed across the range from frying oil through salad dressing and shortening to margarine. The annual consumption of soybean oil per person in the USA rose during the 40-year period from 1959 to 1999 from 2kg to 12 kg. In the meantime the use of coconut oil fell from 0.8 kg to 0.4 kg per person, approximately.

An important element in the evidence against polyunsaturated fat presented by Teicholz (2014) is the trans fat story. Runny fats like soybean oil and canola, converted to firm margarine by partial hydrogenation, produced trans fats that have been shown to increase the risk of heart disease and carcinomas. Eventually, after a long campaign against trans fat by researchers including Enig (2000) it has been legislated that the food label in the US, and beyond, must now list the concentration of trans.

The sort of information presented in *The Big Fat Surprise* and elsewhere has greatly raised the confidence of the “converted” who have embraced VCO and are experiencing benefits in terms of their well-being. The dilemma that remains, however, is that many in the community do not feel confident or independent enough to question the advice given by many GPs and dieticians who have not kept up with developments in nutrition science or who are unable to accept information that contradicts a long-held belief, due to

“connectional inertia” as described above.

The final game-changer will be in the future, as a new generation of health and diet professionals embraces the reported results of research and experience generated by the inclusion of VCO in the diet of ever more consumers. The coconut production and processing communities are already striving to meet demand for VCO. This suggests that as the demand continues its anticipated rise well into the future, the Coconut World, from the farmer, the harvester to the processor and marketer can expect to experience great prosperity.

### Conclusion

The coconut world is undergoing “seismic” change due to a number of factors that are liberating coconut oil from the burden of rejection by the diet policy makers of major consuming nations. This first International Conference on Coconut Oil marks the beginning of an active new phase in advocacy and acceptance of coconut as one of the most valuable components of the human diet. Coconut processing interests have placed significant risk capital in the service of Virgin Coconut Oil and are reaping the reward for money well invested. The combined efforts of national governments, regional agencies such as the Asia Pacific Coconut Community, coconut growers throughout the world, and the processors and marketers who are already “ahead of the game”, are expected to lead to a healthier future for the whole human race through the increased use of coconut oil. Governments of producing countries may need also to pay attention to the situation of local low-income consumers now faced with a rise in the price of their daily diet component of coconut, as the exporters have raised the price paid to the farmer.

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