

Coconut Oil Increases Beneficial Properties in Human Breast Milk

By Cori Young

COCONUT OIL FOUND BENEFICIAL FOR LACTATING MOTHERS...

The unique composition of human breast milk fat includes the fatty acids, lauric acid and capric acid, which have potent antimicrobial properties. These fatty acids offer the nursing infant protection from viruses such as herpes and HIV, protozoa such as giardia lamblia, and bacteria such as chlamydia and helicobacter.

A study published in 1998 in the American Journal of Clinical Nutrition has shown that lactating mothers who eat coconut oil and other coconut products, have significantly increased levels of lauric acid and capric acid in their breast milk. Thus, the milk supply has increased amounts of the protective antimicrobials, which will give even greater protection to the nursing infant.

Pregnant females store fat to assure successful lactation. Any lauric acid and capric acid in the diet becomes part of the adipose stores. The milk fat of a lactating mother is made up of these stores as well as her current diet. If her diet doesn't contain lauric acid, then generally her milk fat will contain around 3% lauric acid and round 1% capric acid.

When a lactating woman adds foods rich in lauric acid to her diet, the amount of lauric acid available in her breastmilk increases substantially to levels three times the original level and nearly double the amount of capric acid. In countries where coconut oil is a diet staple, levels of lauric acid in the mother's milk can be as high as 21% and capric acid can be as high as 6% giving her infant even more protection against viruses, bacteria, and protozoa.

Coconut oil can be used instead of butter in cooking and baking. You can stir it into oatmeal or even use it as a spread. Also, this oil's antimicrobial properties are beneficial for the skin. Pregnant women in many cultures the world over rub coconut oil on their expanding bellies to keep skin soft and prevent itching.

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Coconut: In Support of Good Health in the 21st Century

by

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Abstract

Coconuts play a unique role in the diets of mankind because they are the source of important physiologically functional components. These physiologically functional components are found in the fat part of whole coconut, in the fat part of desiccated coconut, and in the extracted coconut oil. Lauric acid, the major fatty acid from the fat of the coconut, has long been recognized for the unique properties that it lends to nonfood uses in the soaps and cosmetics industry. More recently, lauric acid has been recognized for its unique properties in food use, which are related to its antiviral, antibacterial, and antiprotozoal functions. Now, capric acid, another of coconut's fatty acids has been added to the list of coconut's antimicrobial components. These fatty acids are found in the largest amounts only in traditional lauric fats, especially from coconut. Also, recently published research has shown that natural coconut fat in the diet leads to a normalization of body lipids, protects against alcohol damage to the liver, and improves the immune system's anti-inflammatory response. Clearly, there has been increasing recognition of health-supporting functions of the fatty acids found in coconut. Recent reports from the U.S. Food and Drug Administration about required labeling of the trans fatty acids will put coconut oil in a more competitive position and may help return to its use

by the baking and snack food industry where it has continued to be recognized for its functionality. Now it can be recognized for another kind of functionality: the improvement of the health of mankind.

I. INTRODUCTION

Mr. Chairman and members of the Asian Pacific Coconut Community, I would like to thank you for inviting me to once again speak to this gathering of delegates on the occasion of your 36th session as you celebrate the 30th anniversary of APCC.

When I addressed the 32nd COCOTECH meeting in Cochin, India, I covered two areas of interest to the coconut community. In the first part, I reviewed the major health challenge facing coconut oil at that time, which was based on a supposed negative role played by saturated fat in heart disease. I hope that my talk was able to dispel any acceptance of that notion. In the second part of my talk I suggested that there were some new positive health benefits from coconut that should be recognized. These benefits stemmed from coconut's use as a food with major functional properties for antimicrobial and anti-cancer effects.

In my presentation today, I will bring you up to date about the new recognition of functional foods as important components in the diet. Additionally, I would like to briefly review the state of the anti-saturated fat situation and bring you up to date on some of the research that compares the beneficial effects of saturated fats with those of omega-6 polyunsaturates, as well as the beneficial effects of the saturated fats relative to the detrimental effects of the partially hydrogenated fats and the trans fatty acids. In particular I will review some of the surprising beneficial effects of the special saturates found in coconut oil as they compare with those of the unsaturates found in some of the other food oils. Components of coconut oil are increasingly being shown to be beneficial. Increasingly, lauric acid, and even capric acid, have been the subject of favorable scientific reports on health parameters.

II. FUNCTIONAL PROPERTIES OF LAURIC FATS AS ANTIMICROBIALS

Earlier this year, at a special conference entitled, "Functional Foods For Health Promotion: Physiologic Considerations"; EXPERIMENTAL BIOLOGY '99, Renaissance Washington Hotel, Washington, DC Saturday, April 17, 1999, which was sponsored by the International Life Sciences Institute, ILSI NORTH AMERICA, Technical Committee on Food Components for Health Promotion, the term "functional foods" was defined as "a functional food provides a health benefit over and beyond the basic nutrients."

This is exactly what coconut and its edible products such as desiccated coconut and coconut oil do. As a functional food, coconut has fatty acids that provide both energy (nutrients) and raw material for antimicrobial fatty acids and monoglycerides (functional components) when it is eaten. Desiccated coconut is about 69% coconut fat, as is creamed coconut. Full coconut milk is approximately 24% fat.

Approximately 50% of the fatty acids in coconut fat are lauric acid. Lauric acid is a medium chain fatty acid, which has the additional beneficial function of being formed into monolaurin in the human or animal body. Monolaurin is the antiviral, antibacterial, and antiprotozoal monoglyceride used by the human or animal to destroy lipid-coated viruses such as HIV, herpes, cytomegalovirus, influenza, various pathogenic bacteria, including listeria monocytogenes and helicobacter pylori, and protozoa such as giardia lamblia. Some studies have also shown some antimicrobial effects of the free lauric acid.

Also, approximately 6-7% of the fatty acids in coconut fat are capric acid. Capric acid is another medium chain fatty acid, which has a similar beneficial function when it is formed into monocaprin in the human or animal body. Monocaprin has also been shown to have antiviral effects against HIV and is being tested for antiviral effects against herpes simplex and antibacterial effects against chlamydia and other sexually transmitted bacteria. (Reuters, London June 29, 1999) See below for details.

The food industry has, of course, long been aware that the functional properties of the lauric

oils, and especially coconut oil, are unsurpassed by other available commercial oils. Unfortunately, in the U.S., both during the late 1930s and again during the 1980s and 1990s, the commercial interests of the U.S. domestic fats and oils industry were successful in driving down usage of coconut oil. As a result, in the U.S. and in other countries where the influence from the U.S. is strong, the manufacturer has lost the benefit of the lauric oils in its food products. As we will see from the data I will present in this talk, it is the consumer who has lost the many health benefits that can result from regular consumption of coconut products.

The antiviral, antibacterial, and antiprotozoal properties of lauric acid and monolaurin have been recognized by a small number of researchers for nearly four decades: this knowledge has resulted in more than 20 research papers and several U.S. patents, and this past year it resulted in a comprehensive book chapter, which reviewed the important aspects of lauric oils as antimicrobial agents (Enig 1998). In the past, the larger group of clinicians and food and nutrition scientists has been unaware of the potential benefits of consuming foods containing coconut and coconut oil, but this is now starting to change.

Kabara (1978) and others have reported that certain fatty acids (FAs) (e.g., medium-chain saturates) and their derivatives (e.g., monoglycerides (MGs)) can have adverse effects on various microorganisms: those microorganisms that are inactivated include bacteria, yeast, fungi, and enveloped viruses. Additionally, it is reported that the antimicrobial effects of the FAs and MGs are additive, and total concentration is critical for inactivating viruses (Isaacs and Thormar 1990).

The properties that determine the anti-infective action of lipids are related to their structure: e.g., monoglycerides, free fatty acids. The monoglycerides are active; diglycerides and triglycerides are inactive. Of the saturated fatty acids, lauric acid has greater antiviral activity than either caprylic acid (C-8), capric acid (C-10), or myristic acid (C-14). In general, it is reported that the fatty acids and monoglycerides produce their killing/inactivating effect by lysing the plasma membrane lipid bilayer. The antiviral action attributed to monolaurin is that of solubilizing the lipids and phospholipids in the envelope of the

virus, causing the disintegration of the virus envelope. However, there is evidence from recent studies that one antimicrobial effect in bacteria is related to monolaurin's interference with signal transduction (Projan et al 1994), and another antimicrobial effect in viruses is due to lauric acid's interference with virus assembly and viral maturation (Hornung et al 1994).

Recognition of the antiviral aspects of the antimicrobial activity of the monoglyceride of lauric acid (monolaurin) has been reported since 1966. Some of the early work by Hierholzer and Kabara (1982) that showed virucidal effects of monolaurin on enveloped RNA and DNA viruses was done in conjunction with the Center for Disease Control of the U.S. Public Health Service. These studies were done with selected virus prototypes or recognized representative strains of enveloped human viruses. The envelope of these viruses is a lipid membrane, and the presence of a lipid membrane on viruses makes them especially vulnerable to lauric acid and its derivative monolaurin.

The medium-chain saturated fatty acids and their derivatives act by disrupting the lipid membranes of the viruses (Isaacs and Thormar 1991; Isaacs et al 1992). Research has shown that enveloped viruses are inactivated in both human and bovine milk by added fatty acids and monoglycerides (Isaacs et al 1991), and also by endogenous fatty acids and monoglycerides of the appropriate length (Isaacs et al 1986, 1990, 1991, 1992; Thormar et al 1987).

Some of the viruses inactivated by these lipids, in addition to HIV, are the measles virus, herpes simplex virus-1 (HSV-1), vesicular stomatitis virus (VSV), visna virus, and cytomegalovirus (CMV). Many of the pathogenic organisms reported to be inactivated by these antimicrobial lipids are those known to be responsible for opportunistic infections in HIV-positive individuals. For example, concurrent infection with cytomegalovirus is recognized as a serious complication for HIV+ individuals (Macallan et al 1993). Thus, it would appear to be important to investigate the practical aspects and the potential benefit of an adjunct nutritional support regimen for HIV-infected individuals, which will utilize those dietary fats that are sources of known antiviral, antimicrobial, and antiprotozoal mono-

glycerides and fatty acids such as monolaurin and its precursor lauric acid.

Until now, no one in the mainstream nutrition community seems to have recognized the added potential of antimicrobial lipids in the treatment of HIV-infected or AIDS patients. These antimicrobial fatty acids and their derivatives are essentially nontoxic to man; they are produced in vivo by humans when they ingest those commonly available foods that contain adequate levels of medium-chain fatty acids such as lauric acid. According to the published research, lauric acid is one of the best "inactivating" fatty acids, and its monoglyceride is even more effective than the fatty acid alone (Kabara 1978, Sands et al 1978, Fletcher et al 1985, Kabara 1985).

The lipid-coated (envelope) viruses are dependent on host lipids for their lipid constituents. The variability of fatty acids in the foods of individuals as well as the variability from de novo synthesis accounts for the variability of fatty acids in the virus envelope and also explains the variability of glycoprotein expression, a variability that makes vaccine development more difficult.

Monolaurin does not appear to have an adverse effect on desirable gut bacteria, but rather on only potentially pathogenic microorganisms. For example, Isaacs et al (1991) reported no inactivation of the common *Escherichia coli* or *Salmonella enteritidis* by monolaurin, but major inactivation of *Hemophilus influenzae*, *Staphylococcus epidermidis* and Group B gram positive streptococcus.

The potentially pathogenic bacteria inactivated by monolaurin include *Listeria monocytogenes*, *Staphylococcus aureus*, *Streptococcus agalactiae*, Groups A,F & G streptococci, gram-positive organisms, and some gram-negative organisms if pretreated with a chelator (Boddie & Nickerson 1992, Kabara 1978, Kabara 1984, Isaacs et al 1990, Isaacs et al 1992, Isaacs et al 1994, Isaacs & Schneidman 1991, Isaacs & Thormar 1986, Isaacs & Thormar 1990, Isaacs & Thormar 1991, Thormar et al 1987, Wang & Johnson 1992).

Decreased growth of *Staphylococcus aureus* and decreased production of toxic shock syndrome toxin-1 was shown with 150 mg monolaurin per

liter (Holland et al 1994). Monolaurin was 5000 times more inhibitory against *Listeria monocytogenes* than ethanol (Oh & Marshall 1993). *Helicobacter pylori* is rapidly inactivated by medium-chain monoglycerides and lauric acid, and there appears to be very little development of resistance of the organism to the bactericidal effects (Petschow et al 1996) of these natural antimicrobials.

A number of fungi, yeast, and protozoa are inactivated or killed by lauric acid or monolaurin. The fungi include several species of ringworm (Isaacs et al 1991). The yeast reported is *Candida albicans* (Isaacs et al 1991). The protozoan parasite *Giardia lamblia* is killed by free fatty acids and monoglycerides from hydrolyzed human milk (Hernell et al 1986, Reiner et al 1986, Crouch et al 1991, Isaacs et al 1991). Numerous other protozoa were studied with similar findings; these findings have not yet been published (Jon J. Kabara, private communication, 1997).

Research continues in measuring the effect of the monoglyceride derivative of capric acid monocaprin as well as the effects of lauric acid. *Chlamydia trachomatis* is inactivated by lauric acid, capric acid, and monocaprin (Bergsson et al 1998), and hydrogels containing monocaprin are potent in vitro inactivators of sexually transmitted viruses such as HSV-2 and HIV-1 and bacteria such as *Neisseria gonorrhoeae* (Thormar 1999).

III. ORIGINS OF THE ANTI-SATURATED FAT AGENDA

The coconut industry has suffered more than three decades of abusive rhetoric from the consumer activist group Center for Science in the Public Interest (CSPI), from the American Soybean Association (ASA) and other members of the edible oil industry, and from those in the medical and scientific community who learned their misinformation from groups like CSPI and ASA. I would like to review briefly the origins of the anti-saturated fat, anti-tropical oil campaigns and hopefully give you some useful insight into the issues.

When and how did the anti-saturated fat story begin? It really began in part in the late 1950s,

when a researcher in Minnesota announced that the heart disease epidemic was being caused by hydrogenated vegetable fats. The edible oil industry's response at that time was to claim it was only the saturated fat in the hydrogenated oils that was causing the problem. The industry then announced that it would be changing to partially hydrogenated fats and that this would solve the problem.

In actual fact, there was no change because the oils were already being partially hydrogenated, and the levels of saturated fatty acids remained similar, as did the levels of the trans fatty acids. The only thing that really changed was the term for hydrogenation or hardening listed on the food label.

During this same period, a researcher in Philadelphia reported that consuming polyunsaturated fatty acids lowered serum cholesterol. This researcher, however, neglected to include the information that the lowering was due to the cholesterol going into the tissues, such as the liver and the arteries. As a result of this research report and the acceptance of this new agenda by the domestic edible oils industries, there was a gradual increase in the emphasis on replacing "saturated fats" in the diet and on the consuming of larger amounts of the "polyunsaturated fats." As many of you probably know, this strong emphasis on consuming polyunsaturates has backfired in many ways: the current adjustments being recommended in the U.S. by groups such as the National Academy of Sciences replace the saturates with monounsaturates instead of with polyunsaturates and replace polyunsaturates with monounsaturates.

Early promoters of the anti-saturated fat ideas included companies such as Corn Products Company (CPC International) through a book written by Jeremiah Stamler in 1963, with the professional edition published in 1966 by CPC. This book took some of the earliest pejorative stabs at the tropical oils. In 1963, the only tropical fat or oil singled out as high in saturated fats was coconut oil. Palm oil had not entered the U.S. food supply to any extent, had not become a commercial threat to the domestic oils, and was not recognized in any of the early texts. An observation by the editorial staff of Consumer Reports noted that

"...in 1962...one writer observed, the average American now fears fat (saturated fat, that is) 'as he once feared witches.'"

In 1965, a representative of Procter and Gamble told the American Heart Association to change its Diet/Heart statement, removing any reference to the trans fatty acids. This altered official document encouraged the consumption of partially hydrogenated fats. In the 1970s, this same Procter and Gamble employee served as nutrition chairman in two controlling positions for the National Heart Lung and Blood Institute's Lipid Research Clinic (LRC) trials and as director of one of the LRC centers. These LRC trials were the basis for the 1984 NIH Cholesterol Consensus Conference, which in turn spawned the National Cholesterol Education Program (NCEP). This program encourages consumption of margarine and partially hydrogenated fats, while admitting that trans should not be consumed in excess. The official NCEP document states that "...coconut oil, palm oil, and palm kernel oil... should be avoided..."

In 1966, the U.S. Department of Agriculture documents on fats and oils talked about how unstable the unsaturated fats and oils were. There was no criticism of the saturated fats. That criticism of saturated fat was to come later to this agency when it came under the influence of the domestic edible fats and oils industry, and when it developed the U.S. Dietary Guidelines. These Dietary Guidelines became very anti-saturated fat and remain so to this day. Nevertheless, as we will learn later in my talk, there has started some reversal of the anti-saturated fat stance in the works in this agency in 1998.

In the early 1970s, although a number of researchers were voicing concerns about the trans fats, the edible oil industry and the U.S. Food and Drug Administration (FDA) were engaging in a revolving-door exchange that would (i) promote the increasing consumption of partially hydrogenated vegetable oils, (ii) would condemn the saturated fats, and (iii) hide the trans issue. As an example of this "oily" exchange, in 1971 the FDA's general counsel became president of the edible oil trade association, and he in turn was replaced at the FDA by a food lawyer who had represented the edible oil industry.

From that point on, the truth about any real effects of the dietary fats had to play catch-up. The American edible oil industry sponsored “information” to educate the public, and the natural dairy and animal fats industries were inept at countering any of that misinformation. Not being domestically grown in the U.S., coconut oil, palm oil, and palm kernel oil were not around to defend themselves at that time. The government agencies responsible for disseminating information ignored those protesting “lone voices,” and by the mid-1980s, American food manufacturers and consumers had made major changes in their fats and oils usage -- away from the safe saturated fats and headlong into the problematic trans fats.

Enig and Fallon (1998/1999) have reviewed the above history in “The Oiling of America” published in the Australian magazine *Nexus*. The magazine has placed this review on the internet and it can be viewed or downloaded from the *Nexus* website. The internet addresses for the websites are <http://www.peg.apc.org/~nexus/OilingAmerica.1.html> and <http://www.peg.apc.org/~nexus/OilingAmerica.2.html>.

IV. THE DAMAGING ROLE OF THE U.S. CONSUMER ACTIVIST GROUP CSPI

Some of the food oil industry (especially those connected with the American Soybean Association (ASA)) and some of the consumer activists (especially the Center for Science in the Public Interest (CSPI) and also the American Heart Savers Association) further eroded the status of natural fats when they sponsored the major anti-saturated fat, anti-tropical oils campaign in the late 1980s.

Actually, an active anti-saturated fat bias started as far back as 1972 in CSPI. But beginning in 1984, this very vocal consumer activist group started its anti-saturated fat campaign in earnest. In particular, at this time, the campaign was against the “saturated” frying fats, especially those being used by fast-food restaurants. Most of these so-called saturated frying fats were tallow based, but also included was palm oil in at least one of the hotel/restaurant chains.

Then in a “News Release” in August 1986, CSPI criticized what it called “Deceptive Vegetable Oil Labeling: Saturated Fat Without The Facts,”

referring to “palm, coconut, and palm kernel oil” as “rich in artery-clogging saturated fat.” CSPI further announced that it had petitioned the Food and Drug Administration to stop allowing labeling of foods as having “100% vegetable shortening” if they contained any of the “tropical oils.” CSPI also asked for mandatory addition of the qualifier “a saturated fat” when coconut, palm or palm kernel oils were named on the food label.

In 1988, CSPI published a booklet called “Saturated Fat Attack.” This booklet contained lists of processed foods “surveyed” in Washington, DC supermarkets. The lists were used for developing information about the saturated fat in the products. Section III is entitled “Those Troublesome Tropical Oils,” and it contains statements encouraging pejorative labeling. There were lots of substantive mistakes in the booklet, including errors in the description of the biochemistry of fats and oils and completely erroneous statements about the fat and oil composition of many of the products.

At the same time CSPI was conducting its campaign in 1986, the American Soybean Association began its anti-tropical oil campaign by sending inflammatory letters, etc., to soybean farmers. The ASA took out advertisements to promote a “[tropical] Fat Fighter Kit.” The ASA hired a Washington DC “nutritionist” to survey supermarkets to detect the presence of tropical oils in foods.

Then early in 1987, the ASA petitioned the FDA to require labeling of “Tropical Fats,” and by mid-1987, the Soybean Digest continued an active and increasing anti-tropical oils campaign. At about the same time (June 3, 1987), the *New York Times* published an editorial, “The Truth About Vegetable Oil,” in which it called palm, palm kernel, and coconut oils “the cheaper, artery-clogging oils from Malaysia and Indonesia” and claimed that U.S. federal dietary guidelines opposed tropical oils, although it is not clear that this was so. The “artery-clogging” terminology was right out of CSPI.

Two years later in 1989, the ASA held a press conference with the help of the CSPI in Washington DC in an attempt to counter the palm oil group’s press conference of 6 March. The ASA

“Media Alert” stated that the National Heart Lung and Blood Institute and National Research Council “recommend consumers avoid palm, palm kernel and coconut oils.” Only months before these press conferences, millionaire Phil Sokolof, the head of the National Heart Savers Association (NHSA), purchased the first of a series of anti-saturated fats and anti-tropical fats advertisements in major newspapers. No one has found an overt connection between Sokolof (and his NHSA) and the ASA, but the CSPI bragged about being his advisor.

V. WHAT ABOUT HEART DISEASE AND COCONUT OIL?

The research over four decades concerning coconut oil in the diet and heart disease is quite clear: coconut oil has been shown to be beneficial. This research leads us to ask the question, “should coconut oil be used to both prevent and treat coronary heart disease?”

This statement is based on several reviews of the scientific literature concerning the feeding of coconut oil to humans. Blackburn et al (1988) have reviewed the published literature of “coconut oil’s effect on serum cholesterol and atherogenesis” and have concluded that when “[coconut oil is] fed physiologically with other fats or adequately supplemented with linoleic acid, coconut oil is a neutral fat in terms of atherogenicity.”

After reviewing this same literature, Kurup and Rajmohan (1995) conducted a study on 64 volunteers and found “...no statistically significant alteration in the serum total cholesterol, HDL cholesterol, LDL cholesterol, HDL cholesterol/total cholesterol ratio and LDL cholesterol/HDL cholesterol ratio of triglycerides from the baseline values...” A beneficial effect of adding the coconut kernel to the diet was noted by these researchers.

Kaunitz and Dayrit (1992) have reviewed some of the epidemiological and experimental data regarding coconut-eating groups and noted that the “available population studies show that dietary coconut oil does not lead to high serum cholesterol nor to high coronary heart disease mortality or morbidity.” They noted that in 1989 Mendis et al reported undesirable lipid changes when young

adult Sri Lankan males were changed from their normal diets by the substitution of corn oil for their customary coconut oil. Although the total serum cholesterol decreased 18.7% from 179.6 to 146.0 mg/dl and the LDL cholesterol decreased 23.8% from 131.6 to 100.3 mg/dl, the HDL cholesterol decreased 41.4% from 43.4 to 25.4 mg/dl (putting the HDL values very much below the acceptable lower limit of 35 mg/dl) and the LDL/HDL ratio increased 30% from 3.0 to 3.9. These latter two changes are considered quite undesirable. Mendis and Kumarasunderam (1990) also compared the effect of coconut oil and soy oil in normolipidemic young males, and again the coconut oil resulted in an increase in the HDL cholesterol, whereas the soy oil reduced this desirable lipoprotein. As noted above, Kurup and Rajmohan (1995), who studied the addition of coconut oil alone to previously mixed fat diets, had reported no significant difference from baseline.

Previously, Prior et al (1981) had shown that islanders with high intakes of coconut oil showed “no evidence of the high saturated fat intake having a harmful effect in these populations.” When these groups migrated to New Zealand, however, and lowered their intake of coconut oil, their total cholesterol and LDL cholesterol increased, and their HDL cholesterol decreased. Statements that any saturated fat is a dietary problem is not supported by evidence (Enig 1993).

Studies that allegedly showed a “hypercholesterolemic” effect of coconut oil feeding, usually only showed that coconut oil was not as effective at lowering the serum cholesterol as was the more unsaturated fat to which coconut oil was being compared. This appears to be in part because coconut oil does not “drive” cholesterol into the tissues as does the more polyunsaturated fats. The chemical analysis of the atheroma shows that the fatty acids from the cholesterol esters are 74% unsaturated (41% of the total fatty acids is polyunsaturated) and only 24% are saturated. None of the saturated fatty acids were reported to be lauric acid or myristic acid (Felton et al 1994).

There is another aspect to the coronary heart disease picture. This is related to the initiation of the atheromas that are reported to be blocking arteries. Recent research shows that there is a causative role for the herpes virus and cytomega-

lovirus in the initial formation of atherosclerotic plaques and the relogging of arteries after angioplasty. (New York Times 1991) What is so interesting is that the herpes virus and cytomegalovirus are both inhibited by the antimicrobial lipid monolaurin, but monolaurin is not formed in the body unless there is a source of lauric acid in the diet. Thus, ironically enough, one could consider the recommendations to avoid coconut and other lauric oils as contributing to the increased incidence of coronary heart disease.

Chlamydia pneumoniae, a gram-negative bacteria, is another of the microorganisms suspected of playing a role in atherosclerosis by provoking an inflammatory process that would result in the oxidation of lipoproteins with induction of cytokines and production of proteolytic enzymes, a typical phenomena in atherosclerosis (Saikku 1997). Some of the pathogenic gram-negative bacteria with an appropriate chelator have been reported to be inactivated or killed by lauric acid and monolaurin as well as capric acid and monocaprin (See above, Bergsson et al 1997 and Thormar et al 1999).

However, the microorganisms most frequently identified as probable causative infecting agents are in the herpes virus family and include cytomegalovirus, type 2 herpes simplex (HSV-2), and Cocksackie B4 virus. The evidence for a causative role for cytomegalovirus is the strongest (Ellis 1997, Visseren et al 1997, Zhou et al 1996, Melnick et al 1996, Epstein et al 1996, Chen & Yang 1995), but a role for HSV-2 is also shown (Raza-Ahmad et al 1995). All members of the herpes virus family are reported to be killed by the fatty acids and monoglycerides from saturated fatty acids ranging from C-6 to C-14 (Isaacs et al 1991), which include approximately 80% of the fatty acids in coconut oil.

In spite of what has been said over the past four or more decades about the culpability of the saturated fatty acids in heart disease, they are ultimately going to be held blameless. More and more research is showing the problem to be related to oxidized products. One protection man has against oxidized products is the naturally saturated fats such as coconut oil.

VI. THE LATEST ON THE TRANS FATTY ACIDS

Both the United States and Canada will soon require labeling of the trans fatty acids, which will put coconut oil in a more competitive position than it has been in the past decade. A fear of the vegetable oil manufacturers has always been that they would have to label trans fatty acids. The producers of trans fatty acids have relied on the anti-saturated fat crusade to protect their markets. However, the latest research on saturated fatty acids and trans fatty acids shows the saturated fatty acids coming out ahead in the health race.

It has taken this last decade, from 1988 to 1998, to see changes in perception. During this period, the trans fatty acids have taken a deserved drubbing. Research reports from Europe have been emerging since the seminal report by Mensink and Katan in 1990 that the trans fatty acids raised the low density lipoprotein (LDL) cholesterol and lowered the high density lipoprotein (HDL) cholesterol in serum. This has been confirmed by studies in the U.S. (Judd et al 1994, Khosla and Hayes 1996, Clevidence 1997).

In 1990, the lipids research group at the University of Maryland published a paper (Enig et al 1990) correcting some of the erroneous data sponsored by the food industry in the 1985 review by the Life Sciences Research Office of Federation of American Societies for Experimental Biology (LSRO-FASEB) (Senti 1985) of the trans fatty acids.

Also, in 1993, a group of researchers at Harvard University, led by Professor Walter Willett, reported a positive relationship between the dietary intake of the trans fatty acids and coronary heart disease in a greater than 80,000 cohort of nurses who had been followed by the School of Public Health at Harvard University for more than a decade.

Pietinen and colleagues (1997) evaluated the findings from the large cohort of Finnish men who were being studied for a cancer prevention study. After controlling for the appropriate variables including several coronary risk factors, the authors observed a significant positive association between the intake of trans fatty acids and

the risk of death from coronary disease. There was no association between intakes of saturated fatty acids, or dietary cholesterol and the risk of coronary deaths. This is another example of the differences between the effects of the trans fatty acids and the saturated fatty acids and further challenge to the dietary cholesterol hypothesis.

The issue of the trans fatty acids as a causative factor in remains underexplored, but recent reports have found a connection. Bakker and colleagues (1997) studied the data for the association between breast-cancer incidence and linoleic acid status across European countries since animal and ecological studies had suggest a relationship. They found that the mean fatty acid composition of adipose did not show an association with omega-6 linoleic acid and breast, colon or prostate cancer. However, cancers of the breast and colon were positively associated with the trans fatty acids. Kohlmeier and colleagues (1997) also reported that data from the EURAMIC study showed adipose tissue concentration of trans fatty acids having a positive association with postmenopausal breast cancer in European women.

In 1995 a British documentary on the trans fatty acids aired on a major television station in the U.K. This documentary included an expose of the battle between the edible oil industry and some of the major researchers of the trans fatty acids. Just this year, this same documentary has been aired on television in France where it was requested by a major television station.

Several of the early researchers into the trans problems, Professor Fred Kummerow and Dr. George Mann, have continued their research and/or writing (Mann 1994). The popular media has continued to press the issue of the amounts of trans in the foods, for which there are still no comprehensive government data bases, and a recent published paper from a U.S. Department of Agriculture researcher states:

“Because trans fatty acids have no known health benefits and strong presumptive evidence suggests that they contribute markedly to the risk of developing CHD, the results published to date suggest that it would be prudent to lower the intake of trans fatty acids in the U.S. diet.”(Nelson 1998).

Professor Meir Stampfer from Harvard University refers to trans fats as “one of the major nutritional issues of the nation,” contending that “they have a large impact” and “...we should completely eliminate hydrogenated fats from the diet” (Gottesman 1998).

Lowering the trans fatty acids in the foods in the U.S. can only be done by returning to the use of the natural unhydrogenated and more saturated fats and oils.

Predictions can be made regarding the future of the trans fatty acids. Our ability to predict has been pretty good; for example when Enig Associates started producing the marketing newsletter Market Insights written by Eric Enig, we predicted that trans fatty acids would eventually be swept out of the market. It appears that this prediction may be close to coming true.

Also in the early 1990s, Market Insights predicted that CSPI would change its mind about the trans fatty acids, which it had spent years defending. CSPI did change its mind, and in fact went on the attack regarding the trans, but CSPI never admitted that it had originally been promoting the trans or that the high levels of trans found in the fried foods in the fast food and other restaurants and in many other foods are directly due to CSPI lobbying. While its change was welcome, CSPI’s revisionist version of its own history of support of partially hydrogenated oils and trans fatty acids would have fit perfectly into George Orwell’s “1984”

VII. COMPARISON OF SATURATED FATS WITH THE TRANS FATS

The statement that trans fatty acids are like saturated fatty acids is not correct for biological systems. A listing of the biological effects of saturated fatty acids in the diet versus the biological effects of trans fatty acids in the diet is in actuality a listing of the good (saturated) versus the bad (trans).

When one compares the saturated fatty acids and the trans fatty acids, we see that

(1) saturated fatty acids raise HDL cholesterol, the so-called good cholesterol, whereas the trans

fatty acids lower HDL cholesterol (Mensink and Katan 1990, Judd et al 1994);

(2) saturated fatty acids lower the blood levels of the atherogenic lipoprotein [a], whereas trans fatty acids raise the blood levels of lipoprotein [a] (Khosla and Hayes 1996, Hornstra et al 1991, Clevidence et al 1997);

(3) saturated fatty acids conserve the elongated omega-3 fatty acids (Gerster 1998), whereas trans fatty acids cause the tissues to lose these omega-3 fatty acids (Sugano and Ikeda 1996);

(4) saturated fatty acids do not inhibit insulin binding, whereas trans fatty acids do inhibit insulin binding;

(5) saturated fatty acids are the normal fatty acids made by the body, and they do not interfere with enzyme functions such as the delta-6-desaturase, whereas trans fatty acids are not made by the body, and they interfere with many enzyme functions such as delta-6-desaturase;

and

(6) some saturated fatty acids are used by the body to fight viruses, bacteria, and protozoa, and they support the immune system, whereas trans fatty acids interfere with the function of the immune system.

VIII. WHAT ABOUT THE UNSATURATED FATS?

The arteries of the heart are also compromised by the unsaturated fatty acids. When the fatty acid composition of the plaques (atheromas) in the arteries has been analyzed, the level of saturated fatty acids in the cholesterol esters is only 26 percent compared to that in the unsaturated fatty acids, which is 74 percent. When the unsaturated fatty acids in the cholesterol esters in these plaques are analyzed, it is shown that 38 percent are polyunsaturated and 36 percent are monounsaturated. Clearly the problem is not with the saturated fatty acids.

As an aside, you need to understand that the major role of cholesterol in heart disease and in cancer is as the body's repair substance, and that cholesterol is a major support molecule for the immune system, an important antioxidant, and a necessary component of neurotransmitter receptors. Our brains do not work very well without adequate cholesterol. It should be apparent to scientists that the current approach to cholesterol

has been wrong.

The pathway to cholesterol synthesis starts with a molecule of acetyl CoA that comes from the metabolism of excess protein forming ketogenic amino acids and from the metabolism of excess carbohydrate, as well as from the oxidation of excess fatty acids. Grundy in 1978 reported that the degree of saturation of the fat in the diet did not affect the rate of synthesis of cholesterol. Research reported in 1997 (Jones 1997), however, showed that the polyunsaturated fatty acids in the diet increase the rate of cholesterol synthesis relative to other fatty acids. Furthermore, research reported in 1993 (Hodgsons et al 1993) had shown that dietary intake of the omega-6 polyunsaturated fatty acid linoleic acid was positively related to coronary artery disease.

Thus, those statements made by the consumer activists in the United States to the effect that the saturated fatty acids increase cholesterol synthesis is without any foundation. What happens when there is an increase or a decrease of cholesterol in the serum is more like a shift from one compartment to another as the body tries to rectify the potential damage from the excess polyunsaturated fatty acids. Research by Dr. Hans Kaunitz reported in 1978 clearly showed the potential problems with excess polyunsaturated fatty acids.

IX. RESEARCH SHOWING BENEFICIAL EFFECTS OF EATING THE MORE SATURATED FATS

One major concern expressed by the nutrition community is related to whether or not people are getting enough elongated omega-3 fatty acids in their diets. The elongated omega-3 fatty acids of concern are eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA). Some research has shown that (the basic omega-3 fatty acid) -linolenic acid is not readily converted to the elongated forms in humans or animals, especially when there is ingestion of the trans fatty acids and the consequent inhibition of the delta-6-desaturase enzyme. One recent study (Gerster 1998), which used radioisotope-labeled -linolenic acid to measure this conversion in adult humans, showed that if the background fat in the diet was high in saturated fat, the conversion was

approximately 6% for EPA and 3.8% for DHA, whereas if the background fat in the diet was high in omega-6 polyunsaturated fatty acids (PUFA), the conversion was reduced 40-50%.

Nanji and colleagues (1995) report that a diet enriched in saturated but not unsaturated fatty acids reversed alcoholic liver injury in their animals, which was caused by dietary linoleic acid. These researchers conclude that this effect may be explained by the down-regulation of lipid peroxidation. This is another example of the need for adequate saturated fat in the diet. Cha and Sachan (1994) studied the effects of saturated fatty acid and unsaturated fatty acid diets on ethanol pharmacokinetics. The hepatic enzyme alcohol dehydrogenase and plasma carnitines were also evaluated. The researchers concluded that dietary saturated fatty acids protect the liver from alcohol injury by retarding ethanol metabolism, and that carnitine may be involved.

Hargrove and colleagues (1999) noted the work of Nanji et al and postulated that they would find that diets rich in linoleic acid would also cause acute liver injury after acetaminophen injection. In the first experiment, two levels of fat (15 g/100 g protein and 20 g/100 g protein) were fed using corn oil or beef tallow. Liver enzymes indicating damage were significantly elevated in all the animals except for those animals fed the higher level of beef tallow. These researchers concluded that "diets with high [linoleic acid] may promote acetaminophen-induced liver injury compared to diets with more saturated and monounsaturated fatty acids."

X. RESEARCH SHOWING GENERAL BENEFICIAL EFFECTS FROM FEEDING COCONUT OIL

Research that compares coconut oil feeding with other oils to answer a variety of biological questions is increasingly finding beneficial results from the coconut oil.

Obesity is a major health problem in the United States and the subject of much research. Several lines of research dealing with metabolic effects of high fat diets have been followed. One study used coconut oil to enrich a high fat diet and the results reported were that the "coconut-

oil enriched diet is effective in...[producing]...a decrease in white fat stores." (Portillo et al 1998)

Cleary et al (1999) fed genetically obese animals high fat diets of either safflower oil or coconut oil. Safflower oil-fed animals had higher hepatic lipogenic enzyme activities than did coconut oil fed animals. When the number of fat cells were measured, the safflower oil-fed also had more fat cells than the coconut oil-fed.

Many of the feeding studies produce results at variance with the popular conception. High fat diets have been used to study the effects of different types of fatty acids on membrane phospholipid fatty acid profiles. When such a study was performed on mice, the phospholipid profiles were similar for diets high in linoleic acid from high-linoleate sunflower oil relative to diets high in saturated fatty acids from coconut oil. However, those animals fed the diets high in oleic acid (from the high-oleate sunflower oil) or high in elongated omega-3 fatty acids (from menhaden oil) were not only different from the other two diets, but they also resulted in enlarged spleens in the animals. (Huang and Frische 1992)

Oliart-Ros and colleagues (1998), Instituto Tecnológico de Veracruz, Mexico, reported on effects of different dietary fats on sucrose-induced cardiovascular syndrome in rats. The most significant reduction in parameters of the syndrome was obtained by the n-3 PUFA-rich diet. These researchers reported that the diet thought to be PUFA-deficient presented a tissue lipid pattern similar to the n-3 PUFA-rich diet (fish oil), which surprised and puzzled them. When questioned, it turned out that the diet was not really PUFA-deficient, but rather just a normal coconut oil (nonhydrogenated), which conserved the elongated omega-3 and normalized the omega-6-to-omega-3 balance.

A recent study measured the effect of high-fat diets, fed for more than three months to the neonatal pig, on the HMG-CoA reductase enzyme's function and gave some surprises. There were two feeding protocols: one with the added cholesterol and one without added cholesterol, but both with coconut oil. The hepatic reductase activity, which was the same in all groups at the beginning of the feeding on the third day and similar on the 42nd day, was increased with

and without added cholesterol on the 13th day and then decreased on the 25th day. The data was said to suggest that dietary cholesterol suppressed hepatic reductase activity in the young pigs regardless of their genetic background, that the stage of development was a dominant factor in its regulation, and that both dietary and endogenously synthesized cholesterol was used primarily for tissue building in very young pigs. (McWhinney et al 1996) The feeding of coconut oil did not in any way compromise the normal development of these animals.

When compared with feeding coconut oil, feeding two different soybean oils to young females caused a significant decrease in HDL cholesterol. Both soybean oils, one of which was extracted from a new mutant soybean thought to be more oxidatively stable, were not protective of the HDL levels (Lu Z et al 1997).

Trautwein et al (1997) studied cholesterol-fed hamsters on different oil supplements for plasma, hepatic, and biliary lipids. The dietary oils included butter, palm stearin, coconut oil, rapeseed oil, olive oil, and sunflowerseed oil. Plasma cholesterol concentrations were higher (9.2 mmol/l) for olive oil than for coconut oil (8.5 mmol/l), hepatic cholesterol was highest in the olive oil group, and none of the diet groups differed for biliary lipids. Even in this cholesterol-sensitive animal model, coconut oil performed better than olive oil.

Smit and colleagues (1994) had also studied the effect of feeding coconut oil compared with feeding corn oil and olive oil in rats and measured the effect on biliary cholesterol. Bile flow was not different between the three diets, but the hepatic plasma membranes showed more cholesterol and less phospholipid from corn and olive oil feeding relative to coconut oil feeding.

Several studies (Kramer et al 1998) have pointed out problems with canola oil feeding in newborn piglets, which result in the reduction in number of platelets and the alteration in their size. There is concern for similar effects in human infants. These undesirable effects can be reversed when coconut oil or other saturated fat is added to the feeding regimen (Kramer et al 1998).

Research has shown that coconut oil is needed

for good absorption of fat and calcium from infant formulas. The soy oil (47%) and palm olein (53%) formula gave 90.6% absorption of fat and 39% absorption of calcium, whereas the soy oil (60%) and coconut oil (40%) gave 95.2% absorption of fat and 48.4% absorption of calcium (Nelson et al 1996). Both fat and calcium are needed by the infant for proper growth. These results clearly show the folly of removing or lowering the coconut oil in infant formulas.

XI. RESEARCH SHOWING A ROLE FOR COCONUT IN ENHANCING IMMUNITY AND MODULATING METABOLIC FUNCTIONS

Coconut oil appears to help the immune system response in a beneficial manner. Feeding coconut oil in the diet completely abolished the expected immune factor responses to endotoxin that were seen with corn oil feeding. This inhibitory effect on interleukin-1 production was interpreted by the authors of the study as being largely due to a reduced prostaglandin and leukotriene production (Wan and Grimble 1987). However, the damping may be due to the fact that effects from high omega-6 oils tend to be normalized by coconut oil feeding. Another report from this group (Bibby and Grimble 1990) compared the effects of corn oil and coconut oil diets on tumor necrosis factor-alpha and endotoxin induction of the inflammatory prostaglandin E2 (PGE2) production. The animals fed coconut oil did not produce an increase in PGE2, and the researchers again interpreted this as a modulatory effect that brought about a reduction of phospholipid arachidonic acid content. A study from the same research group (Tappia and Grimble 1994) showed that omega-6 oil enhanced inflammatory stimuli, but that coconut oil, along with fish oil and olive oil, suppressed the production of interleukin-1.

Several recent studies are showing additional helpful effects of consuming coconut oil on a regular basis, thus supplying the body with the lauric acid derivative monolaurin. Monolaurin and the ether analogue of monolaurin have been shown to have the potential for damping adverse reactions to toxic forms of glutamic acid (Dave et al 1997). Lauric acid and capric acid have been reported to have very potent effects on insulin secretion (Garfinkel et al 1992). Using a model

system of murine splenocytes, Witcher et al 1996 showed that monolaurin induced proliferation of T cells and inhibited the toxic shock syndrome toxin-1 mitogenic effects on T cells.

Monserrat and colleagues (1995) showed that a diet rich in coconut oil could protect animals against the renal necrosis and renal failure produced by a diet deficient in choline (a methyl donor group). The animals had less or no mortality and increased survival time as well as decreased incidence or severity of the renal lesions when 20% coconut oil was added to the deficient diet. A mixture of hydrogenated vegetable oil and corn oil did not show the same benefits.

The immune system is complex and has many feedback mechanisms to protect it, but the wrong fat and oils can compromise these important mechanisms. The data from the several studies show the helpful effects of coconut fat. Additionally, there are anecdotal reports that consumption of coconut is beneficial for individuals with the chronic fatigue and immune dysfunction syndrome known as CFIDS.

XII. U.S. PATENTS FOR MEDICAL USES OF LAURIC OILS, MEDIUM-CHAIN FATTY ACIDS, AND THEIR DERIVATIVES SUCH AS MONOLAURIN

A number of patents have been granted in the United States for medical uses of lauric oils, lauric acid, and monolaurin. Although one earlier patent was granted to Professor Kabara more than three decades ago, the rest of these patents have been granted within the past decade.

In 1989 a patent was issued to the New England Deaconess Hospital (Bistrián et al 1989) for the invention titled "Kernel Oils and Disease Treatment." This treatment required lauric acid as the primary fatty acid source with lauric oils constituting up to 80% of the diet "using naturally occurring kernel oils."

In 1991 and 1995, two patents were issued to the group of researchers whose work has been reviewed above. The first invention (Isaacs et al 1991) was directed to antiviral and antibacterial activity of both fatty acids and monoglycerides, primarily against enveloped viruses. The claims

were for "a method of killing enveloped viruses in a host human...wherein the enveloped viruses are AIDS viruses...[or]...herpes viruses...[and the]...compounds selected from the group consisting of fatty acids having from 6 to 14 carbon atoms and monoglycerides of said fatty acids... [and]...wherein the fatty acids are saturated fatty acids."

The second patent (Isaacs et al 1995) was a further extension of the earlier one. This patent also included discussion of the inactivation of envelop viruses and specifically cited monoglycerides of caproic, caprylic, capric, lauric, and myristic acid. These fatty acids make up more than 80% of coconut oil. Also included in this patent was a listing of susceptible viruses and some bacteria and protozoa.

Although these latter patents may provide the owners of the patents with the ability to extract royalties from commercial manufacturers of monoglycerides and fatty acids, they cannot require royalties from the human gastrointestinal tract when it is the "factory" that is doing the manufacturing of the monoglycerides and fatty acids. Clearly though, these patents serve to illustrate to us that the health-giving properties of monolaurin and lauric acid are well-recognized by some individuals in the research arena, and they lend credence to our appropriate choice of lauric oils for promoting health and as adjunct treatment of viral diseases.

XIII. HOW CAN WE GET SUFFICIENT COCONUT FAT INTO THE FOOD SUPPLY IN THE U.S. AND OTHER COUNTRIES THAT NEED ITS BENEFITS?

I would like to review for you my perception of the status regarding the coconut and coconut products market in the North American countries such as the United States and Canada at the end of the 20th century and the beginning of the 21st century.

Coconut products are trying to regain their former place in several small markets. The extraction of oil from fresh coconut has been reported in the past decade and my impression is that this is being considered as a desirable source of minimally processed oil, which produces an oil with

desirable characteristics for the natural foods market.

There have been some niche markets for coconut products developing during the past half-decade. These are represented primarily by the natural foods and health foods producers. Some examples are the new coconut butters produced in the U.S. and Canada by Omega Nutrition and Carotec, Inc. And, this is no longer as small a market as it has been in past years. Desiccated coconut products, coconut milk, and even coconut oil are appearing on the shelves of many of these markets. After years of packaging coconut oil for skin use only, one of the large suppliers of oils to the natural foods and health foods stores has introduced coconut oil for food use, and it has appeared within the last few months on shelves in the Washington, DC metropolitan area along with other oils. I believe I indirectly had something to do with this turn of events.

XIV. CONCLUSIONS AND RECOMMENDATIONS

As we come close to the end of the year 1999 and set our sights on what could happen in the year 2000 and beyond, there is much to be gained from pursuing the functional properties of coconut for improving the health of humanity.

On the occasion of the 30th anniversary of the Asian Pacific Coconut Community, at this 36th meeting of APCC, I wanted to bring you a message that I hope will encourage you to continue your endeavors on behalf of all parts of the coconut industry. Coconut products for inedible and especially edible uses are of the greatest importance for the health of the entire world.

Some of what I have been telling you, most of you already know. But in saying these things for the record, it is my intention to tell those who did not know all the details until they heard or read this paper about the positive properties of coconut.

Coconut oil is a most important oil because it is a lauric oil. The lauric fats possess unique characteristics for both food industry uses and also for the uses of the soaps and cosmetic industries. Because of the unique properties of coconut oil, the fats and oils industry has spent untold millions to

formulate replacements from those seed oils so widely grown in the world outside the tropics. While it has been impossible to truly duplicate coconut oil for some of its applications, many food manufacturers have been willing to settle for lesser quality in their products. Consumers have also been willing to settle for a lesser quality, in part because they have been fed so much misinformation about fats and oils.

Desiccated coconut, on the other hand, has been impossible to duplicate, and the markets for desiccated coconut have continued. The powdered form of desiccated coconut now being sold in Europe and Asia has yet to find a market in the U.S., but I predict that it will become an indispensable product in the natural foods industry. Creamed coconut, which is desiccated coconut very finely ground, could be used as a nut butter.

APCC needs to promote the edible uses of coconut, and it needs to promote the reeducation of the consumer, the clinician, and the scientist. The researcher H. Thormar (Thormar et al 1999) concluded his abstract with the statement that monoglycerin "...is a natural compound found in certain foodstuffs such as milk and is therefore unlikely to cause harmful side effects in the concentrations used." It is not monoglycerin that is found in milk, but capric acid. It is likely safe at most any level found in food. However, the levels in milk fat are at most 2 percent whereas the levels in coconut fat are 7 percent.

One last reference for the record. Sircar and Kansra (1998) have reviewed the increasing trend of atherosclerotic disease and type-2 diabetes mellitus in the Indians from both the subcontinent of India and abroad. They note that over the time when there has been an alarming increase in the prevalence of these diseases, there has been a replacement of traditional cooking fats with refined vegetable oils that are promoted as heart-friendly, but which are being found to be detrimental to health. These astute researchers suggest that it is time to return to the traditional cooking fats like ghee, coconut oil, and mustard oil.

There are a number of areas of encouragement. The nutrition community in the United States is slowly starting to recognize the difference between medium chain saturated fatty acids and other saturated fatty acids. We predict now that

the qualities of coconut, both for health and food function, will ultimately win out.

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HIV - AIDS

Can coconut oil reduce the viral load of HIV-AIDS patients? "Initial trials have confirmed that coconut oil does have an anti-viral effect and can beneficially reduce the viral load of HIV patients", University of the Philippines' Emeritus professor of pharmacology Dr. Conrato S. Dayrit said.

A minimum of 50 ml of coconut oil would contain 20 to 25 grams of lauric acid, which indicates that the oil is metabolized in the body to release monolaurin which is an antibiotic and an anti-viral agent. Among the saturated fatty acids, lauric acid has the maximum anti-viral activity, he said. Based on this research, the first clinical trial using monolaurin as monotherapy on some of the HIV patients was conducted recently. Dr. Dayrit's conclusions after the study: "This initial trial confirmed the anecdotal reports that coconut oil does have an anti-viral effect and can beneficially reduce the viral load of HIV patients. The positive anti-viral action was seen not only with the monoglyceride of lauric acid but with coconut oil itself. This indicates that coconut oil is metabolized to monoglyceride forms of C-8, C-10, C-12 to which it must owe its anti-pathogenic activity."

The entire results of Dr. Dayrit's study can be found here in PDF format.

On July 19, 1995, Dr. Mary Enig, noted biochemist and nutritionist, was quoted in an article published in *The HINDU*, India's National Newspaper as stating that coconut oil is converted by the body into "Monolaurin" a fatty acid with anti-viral properties that might be useful in the treatment of AIDS. The staff reporter for *The HINDU* wrote about Enig's presentation at a press conference in Kochi and wrote the following:

"There was an instance in the US in which an infant tested HIV positive had become HIV negative. That it was fed with an infant formula with a high coconut oil content gains significance in this context and at present an effort was on to find out how the 'viral load' of an HIV infected baby came down when fed a diet that helped in

the generation of Monolaurin in the body.”

The reporter commented on Enig’s observations that “Monolaurin helped in inactivating other viruses such as measles, herpes, vesicular stomatitis and Cytomegalovirus (CMV) and that research undertaken so far on coconut oil also indicated that it offered a certain measure of protection against cancer-inducing substances.”

Enig stated in an article published in the Indian Coconut Journal, Sept. 1995 that Monolaurin, of which the precursor is lauric acid, disrupted the lipid membranes of envelope viruses and also inactivated bacteria, yeast and fungi. She wrote: “Of the saturated fatty acids, lauric acid has greater anti-viral activity than either caprylic acid (C-10) or myristic acid (C-14). The action attributed to Monolaurin is that of solubilizing the lipids .in the envelope of the virus causing the disintegration of the virus envelope.”

Being HIV positive myself, and having things very under control, there are a couple of concerns I have and questions. The Virgin Coconut Oil? Absolutely amazing stuff! It has given me back the energy and feeling good that the antivirals can knock out of you. Bill from The Coconut Diet Forums in answer to someone else’s request for information on coconut oil and AIDS.

Dr. Mary Enig has also written a book entitled “Nutrients and Foods in AIDS,” and one of the chapters is published on her website here. (Frequently unavailable - if so try at a later date)

In a July 1997 newsletter entitled “Keep Hope Alive” an interview with Chris Dafoe was recorded. Chris Dafoe of Cloverdale, IN who, based on his lab numbers, thought the end was near in September, 1996. His HIV viral load was over 600,000, CD4 count was 10 and CD8 at 300. He prepaid his funeral and decided to take his last vacation in the jungles of South America with an Indian tribe in the Republic of Surinam. Around October 14, 1996, he began eating daily a dish of cooked coconut which was prepared by the local Indians. By Dec. 27th, 1996, a mere 2 and 1/2 months later, his viral load was at non-detectable levels and he had gained 32 lbs and was feeling great. He had some other people he knew with HIV try using coconuts in their diet, and they experienced the same results. The entire

interview is recorded here.

A woman named Betty buys Tropical Traditions Virgin Coconut Oil uses it in her ministry to the sick. She shares the following story of her friend with HIV that wishes to remain anonymous:

My friend B... is an HIV patient. He was dying in the hospital for 3 years and his body was covered with acne. There was also one dollar size boil on his left hip. When I got my first order of Virgin Coconut Oil , I gave him a quart of the oil to try. The result was amazing! After my friend took it for less than 2 weeks, the acne disappeared. The big boil on his hip started to heal and at this time is completely gone. After more than a month on coconut oil, his skin is now baby silk. You would think he is a different person. His recent blood test showed great improvement. The helper cells (T- cells) which were at level 60 are now at a higher level of 608 after about one and a half months of taking the oil consistently. He is taking the minimum amount of 3.5 tablespoons per day. The viral load is now down to 50. That was almost on the 100 level before he used the oil. My friend is not completely healed yet but he has come a long way from where he was before because of this amazing oil. I will keep on introducing this amazing oil to my friends!

Recently the PATA International-Potato and Products Aid Alliance To Africa committed to distribute Virgin Coconut Oil to Africa for distribution among HIV - AIDS sufferers. They state:

“AIDS is the modern day Black Plague. Millions have all ready died from this disease, leaving behind millions of orphans. Millions more will follow in death, unless a low cost way of controlling this illness is found quickly.

Several long term world studies sponsored by various health organizations have found that the high content of lauric acid in unrefined coconut oil can prolong the lives of AIDS patients by dissolving the covering of the virus itself. This same action has been found effective against other infectious, tropical based diseases as well.”

If the results from the smaller studies duplicate themselves in the clinics in Africa, PATA intends to extend the distribution of Virgin Coconut oil in Africa.

Was diagnosed Hiv+ 6 months ago. I started using VCO (3 tablespoons, three times a day) 2 months ago. Viral load went down from 15,500 to 6,000. CD4 count went up from 615 to 705. I am obviously very excited about these results. Nicola - South Africa, reported on The Coconut Diet Forums

Virgin Coconut Oil for Weight Loss

I would like to say that I have been on Virgin Coconut Oil for the past 2 months (4 tablespoons daily) and feel better than I have in a long time! My energy levels are up & my weight is down. I am never hungry anymore, & have incorporated a daily exercise routine & have lost 20 pounds. Paula (Coconut Diet Forums)

The above quote is quite typical of what we are seeing from those who are switching to Virgin Coconut Oil (VCNO) in place of less healthy oils in their diet. Many people are reporting that consumption of VCNO is bringing about increased energy levels, fewer cravings for carbs and sweets, and a more satisfied feeling of being “full” after meals.

Since beginning to use Tropical Traditions Virgin coconut oil, about 8 months ago, I have: experienced a noticeable increase in my energy, rid myself of cravings for carbs, cleared up my complexion (which has always been a problem) gotten the silkiest, most glorious hair from using it internally AND lost 16 pounds. This oil does all that it promises, and more! Sharon Elaine, author

So how does Virgin Coconut Oil provide these weight loss benefits?

Low-fat Diets Don't Work

Before looking at the specific properties of coconut oil, it is helpful to understand that modern nutrition counsel has made a huge mistake in teaching that low-fat diets are healthy and lead to weight loss. For decades now we have been told to cut back on fat in our diet if we want to lose weight. Marketers of low-fat foods have championed this concept. So what has been the result? According to the US Center for Disease Control:

In 1999–2000, an estimated 30% of U.S adults

aged 20 years and older — nearly 59 million people — were obese, defined as having a body mass index (BMI) of 30 or more.

Source: National Health and Nutrition Examination Survey 1999–2000

In 1999–2000, an estimated 64% of U.S adults aged 20 years and older were either overweight or obese, defined as having a body mass index (BMI) of 25 or more.

Source: National Health and Nutrition Examination Survey 1999–2000

Health and Human Services Secretary Tommy G. Thompson states: “We’ve seen virtually a doubling in the number of obese persons over the past two decades and this has profound health implications. Obesity increases a person’s risk for a number of serious conditions, including diabetes, heart disease, stroke, high blood pressure, and some types of cancer.”¹

Obviously, low-fat diets have not helped Americans lose weight, as today nearly two thirds of all adults in the US are classified as overweight. We’ve been told for years that we should avoid fat as much as possible. Some people have been on a torturous low-fat regimen, trying to avoid all fat in their diet. Now we are learning about the dangers of low-fat diets. Certain fats are necessary and even healthy, but which ones?

My name is Kelly, and I have been on a quest for health for several years now. At one time I was severely obese. I have since lost 140 pounds. I read about the health benefits of coconut oil over a year ago, and added the oil to my daily regimen. Within a week, I had more energy, and was feeling like a different person. I love Tropical Traditions Virgin Coconut Oil, it is the best I have tried, and I will continue to use this oil forever. The quality cannot be matched. Kelly - Lander, WY

Fats in History

Fats have always been a part of human nutrition. Rex Russell, M.D. writes: “It was 1944, and World War II was roaring. A young mother was wasting away with an infection diagnosed as tuberculosis. Antibiotics were unavailable. Her

doctor prescribed (1) isolation, (2) bed rest, (3) exercise (eventually) and (4) a diet high in fat. Surprising, but true! High-fat diets were often recommended by the medical profession during those years. Before you scoff, you might want to know that this lady recovered. She is my mother, and she has stayed on this diet through the years. Presently she is enjoying her great-grandchildren”² So while the experts claimed “fats are good” prior to World War II, now we hear just the opposite.

So what actually constituted a “high-fat” diet back in the 1800s until the 1940s? Basically butter, eggs, nuts and animal fats such as lard and beef tallow. Margarines, which were introduced in the 1860s, were butter substitutes made with animal fats such as lard and tallow or the saturated vegetable oils from coconut oil and palm oils. These high-fat diets, considered then to be healthy, were rich in saturated fats, today seen by many as the worst possible fat one can consume. However, drastically reducing saturated fats from the modern diet has not solved any health problems, and statistics show that obesity rates are at an all-time high. The low-fat advice is losing credibility.

I gained 80 lbs. with my first [baby] and 60 with my second (who I am still nursing). I was able to lose 50 of the first 80 pounds before my second one was conceived. This means I started off my second pregnancy 30 pounds heavier. However, we are of a “quiver full” mindset and would not prevent another conception in order for me to lose weight. Since October (when I had my second daughter), I’ve been able to lose 61 pounds (praise God!). Coconut oil was (and is) a big part of my success. I use it for most of my cooking (occasionally I use Olive Oil and butter) and for body care. I feel like it helped my energy level. It also helped my with some bowel issues I was experiencing. Holly (Coconut Diet Forums)

Fats and oils are technically known as “lipids.” If a lipid is liquid at room temperature, it is called an “oil.” If it is solid, it is called a “fat.” Fats can be found in many food sources in nature: animal meats (such as tallow and lard), marine animals (fish oil), vegetables and fruits (such as olives, avocados, coconuts, etc.), nuts and seeds/legumes (soybeans, sesame seeds, peanuts, cashews, grape seeds, etc.), and whole grains

(wheat, rice, etc. – must contain the bran and all components to benefit from all the oils present). A diet rich in natural foods will be a naturally high-fat diet! It is virtually impossible to eliminate fats from our diet. And we wouldn’t want to! Fats are an essential part of life. Without them, we could not survive.

Four vitamins—A, D, E, and K—are soluble in fat; fat carries fat-soluble vitamins. When fat is removed from a food, many of the fat-soluble compounds are also removed.

Fat also adds satiety to our meal—a feeling of having had enough to eat. Fat-free and low-fat foods are one of the reasons some people over-eat carbohydrates, which really packs on the pounds. They just don’t feel like they’ve had enough to eat, even when the volume has been more than enough.

I have been taking a tablespoon of coconut oil three times daily with meals. Taking the oil with my meals seems to give me a “full feeling” a lot faster. My sweet tooth has practically vanished—and this is from someone who should have bought stock in Hershey’s long ago! Ironically, facilitating weight loss was my main reason for trying the coconut oil diet, but with all the wonderful benefits I am experiencing, the weight loss aspect almost seems like an afterthought. About three days into the routine, I had an energy rush on a Saturday morning that kept me going until well after lunch. I can’t believe how much I got done that day! My mental state of mind seemed to be much sharper. I was able to focus on the tasks at hand without getting sidetracked. I was not exhausted at the end of running my errands, which included traipsing around a huge mall. It seemed like I was practically running, rather than the leisurely walking that was formerly my habit. In addition to my energy level, my mood has been very stable—no up and down mood swings—even with the onset of PMS! My husband commented yesterday on how soft and silky my skin felt, and I have not used any lotion since I started taking the oil. Theresa (Coconut Diet Forums)

Fats for Animal Feeds

One interesting way to study the role of fats and their affect on weight loss or weight gain is to study the animal feed industry. If ever there was a group of people with economic interest in weight gain, it is the livestock industry.

Back in the days when fat was “in,” the fatter the pig you could raise the better. Lard was a basic staple for cooking in the days of our forefathers. It was found that feeding pigs polyunsaturated fats (primarily soybean and corn oil) would put more fat on them. This is the reaction of the longer chain fatty acids found in vegetable oils, and is well documented in the scientific literature.

Today however, we’ve come full circle with our new low-fat mantra, and the consumer demand is now for low-fat meats. So how does one produce a leaner pork? Well according the Department of Animal Science of North Carolina State University, during the “finishing time” before slaughter, you stop feeding them polyunsaturated oils and start feeding them saturated fats.³ They used beef tallow in their experiment, which they found was a bit hard for the pigs to digest. So some farmers are now actually starting to use coconut oil, a plant-based saturated fat, instead.

So what are the fats found on the shelves of grocery stores today, that make up the majority of the US diet? Polyunsaturated fats: mostly soybean oil, which commonly is referred to as vegetable oil. These are the same fats that have been known to fatten livestock in the animal feed business. The saturated fats, which made up most of the fats in the diet of our forefathers, have been almost banned by modern nutrition advice. The result: lean pigs and obese people!!

Low-Carb Diets: Half the Story

Gary Taubes wrote a startling article in the New York Times in 2002 titled “What If it Were All a Big Fat Lie!” In it he stated:

The cause of obesity [is] precisely those refined carbohydrates at the base of the famous Food Guide Pyramid -- the pasta, rice and bread -- that we are told should be the staple of our healthy low-fat diet, and then add on the sugar or corn syrup in the soft drinks, fruit juices and sports

drinks that we have taken to consuming in quantity if for no other reason than that they are fat free and so appear intrinsically healthy. While the low-fat-is-good-health dogma represents reality as we have come to know it, and the government has spent hundreds of millions of dollars in research trying to prove its worth, the low-carbohydrate message has been relegated to the realm of unscientific fantasy.

Over the past five years, however, there has been a subtle shift in the scientific consensus. It used to be that even considering the possibility of the alternative hypothesis, let alone researching it, was tantamount to quackery by association. Now a small but growing minority of establishment researchers have come to take seriously what the low-carb-diet doctors have been saying all along. Walter Willett, chairman of the department of nutrition at the Harvard School of Public Health, may be the most visible proponent of testing this heretic hypothesis. Willett is the de facto spokesman of the longest-running, most comprehensive diet and health studies ever performed, which have already cost upward of \$100 million and include data on nearly 300,000 individuals. Those data, says Willett, clearly contradict the low-fat-is-good-health message ‘and the idea that all fat is bad for you; the exclusive focus on adverse effects of fat may have contributed to the obesity epidemic.’⁴

This started the current low-carb tidal wave because people generally have found that it is true: if you cut out refined carbohydrates you will lose weight.

But while these new low-carb diets are now challenging the low-fat hypothesis, there still seems to be mass confusion as to which fats and oils are actually healthy, and which ones are not. And no wonder. Probably no other food group has been politicized more in American nutrition than fats. With all the books and literature written on the subject, and each one practically contradicting each other, there is really only one book written by a lipid expert with no commercial ties to anyone in the edible oil industry. That book is “Know Your Fats: The Complete Primer for Understanding the Nutrition of Fats, Oils, and Cholesterol” by Dr. Mary Enig, a nutritionist/biochemist with her Ph.D. in Nutritional Sciences from the University of Maryland. Much of her work is fea-

tured in the Weston Price Foundation that studies traditional foods.

I just had to tell you that your product has changed my life. For the past ten years I have been fighting hypothyroidism. I have gained over sixty pounds and it seems that lately my doctor is increasing the dosage of my thyroid medication nearly every month. After doing a lot of research, I first learned that it is probably up to me to cure myself, with a high protein - low carb diet. I started my new eating routine about three weeks ago and about a week later, after reading an article in Woman's World Magazine, I purchased a 32 ounce jar of Tropical Traditions Virgin Coconut Oil at a local nutrition store. I mix 2 tablespoons with a low-carb protein drink every morning and the energy I sustain throughout the day is amazing. I have also lost 11 pounds in 3 weeks and walking on my treadmill for 30 minutes every evening after work is almost effortless. Thank You for this wonderful product. Cheryl - Texas

Let's face it. The low-fat dietary dictum is a multi-billion dollar industry built upon a foundation of sinking sand. Not only does the scientific research show that the polyunsaturated vegetable oils promote weight gain, it also shows that they are not good as an animal feed either. While they do promote weight gain in livestock, they do so at the expense of another essential fatty acid: conjugated linoleic acid (CLA). CLA is found primarily in beef and dairy products, and cannot be produced in the human body. Research has shown that animals grazed strictly on grass, their natural diet, can have levels of CLA hundreds of times higher than animals raised on grain feeds. Also, in a study done by the Department of Animal Science at Southern Illinois University in 2003, it was found that beef finished off on soybean oil directly reduced the amount of CLA produced by ruminant animals.⁵ What are the known benefits of CLA, now that we have almost lost it from our meat and dairy sources? Among its benefits are: it destroys cancer cells, it reduces tumors, and it promotes weight loss while increasing muscle growth. (Note: you can purchase grass-fed beef and raw grass-fed cheese high in CLA not found in stores here at Tropical Traditions if you live in the US)

So while many people are seeing weight loss on low-carb diets because they are cutting back on

refined carbohydrates, many do not see weight loss because they are still lacking proper fats in their diet, and most of the popular low-carb diets are giving mixed messages about which fats are healthy and which ones are not. If you choose the wrong fat and consume large quantities of it, such as hydrogenated polyunsaturated fats full of trans fatty acids, not only will you not have much success in losing weight, you will probably develop a whole host of other health problems.

Flawed "Science"

When a dietary philosophy has been promoted as long as the current low-fat dogma has, and a multi-billion dollar industry feeds off it, we can expect it to die a slow death with much opposition, as America gets fatter and fatter because the popular media continues to propagate the low-fat myth. It is amazing to read new studies conducted that start with this myth as fact, and then construct their whole study to support it, never once questioning the "wisdom" behind the myth that is just accepted without question as fact.

In a study published by British Journal of Nutrition, entitled "Effects of including a ruminally protected lipid supplement in the diet on the fatty acid composition of beef muscle," the abstract begins like this: "Enhancing the polyunsaturated fatty acid (PUFA) and decreasing the saturated fatty acid content of beef is an important target in terms of improving the nutritional value of this food for the consumer." With this "truth" declared without any supporting evidence whatsoever, it goes on to show how one can increase the PUFA content of beef while decreasing the saturated fat content by feeding cows soybean, linseed and sunflower-seed oils.⁶ And because this entire generation has been brainwashed into believing saturated fats are bad and polyunsaturated fats are good, this is seen as positive!

But wait, it gets even worse. Have you noticed all the news lately about the epidemic of obesity among children? A study was published in 2003 by the Journal of the American Diet Association entitled "Soy-enhanced lunch acceptance by preschoolers." The objective: "To evaluate acceptance of soy-enhanced compared with traditional menus by preschool children. Soy-enhanced foods were substituted on a traditional cycle menu, and the amount eaten, energy, and

nutrient values for traditional and soy-enhanced lunches were compared.” The conclusion? “Soy-enhanced foods were successfully substituted for 23 traditional foods included in the cycle menus. Soy-enhanced foods tended to be higher in energy, protein, and iron. Traditional lunches tended to be higher in fat, saturated fat, and vitamin A.” Therefore “Preschool programs can substitute soy-enhanced for traditional foods, which will add variety to the diet without sacrificing taste, energy, or nutrient value.”⁶ Great! So since we start with the presupposition that saturated fats are bad and polyunsaturated fats are good, we can now design a study to “prove” we should be feeding preschoolers soy instead of “traditional foods.” And people continue to ask why children are so overweight today..... Other concerns about soy and children are not even addressed in this study, such as how large amounts of plant hormones (phyto-estrogens) in soy are equal to adult levels and can cause severe damage to the endocrine system of children.⁷

Traditional Fats are Best

So while we wait for the science to catch up with the truth, here is a better idea. Let’s go back and eat the traditional fats our forefathers and other traditional societies have eaten for hundreds and even thousands of years, and were known to be healthy. These fats are rich in saturated fats, and include healthy traditionally raised meat, dairy, and eggs. In tropical climates it includes coconut oil and palm oil. Coconut oil is unique in nature with medium chain fatty acids that are also found in human breast milk, with volumes of research showing that it leads to greater metabolism and weight loss.

Researchers now know that weight loss associated with coconut oil is related to the length of the fatty acid chains contained in coconut oil. Coconut oil contains what are called medium chain fatty acids, or medium chain triglycerides (MCTs for short). These medium chain fatty acids are different from the common longer chain fatty acids found in other plant-based oils. Most vegetable oils are composed of longer chain fatty acids, or triglycerides (LCTs). LCTs are typically stored in the body as fat, while MCTs are burned for energy. MCTs burn up quickly in the body. Coconut oil is nature’s richest source of MCTs that increase metabolic rates and lead to

weight loss. MCTs promote what is called thermogenesis. Thermogenesis increases the body’s metabolism, producing energy. People in the animal feed business have known this truth for quite some time. If you feed animals vegetable oils, they put on weight and produce more fatty meat. If you feed them coconut oil, they will be very lean.

There are many studies proving this concept of thermogenesis and MCTs in the scientific literature. In 1989 a study was done in the Department of Pediatrics, Vanderbilt University, at Nashville TN. Ten male volunteers (ages 22 to 44) were overfed (150% of estimated energy requirement) liquid formula diets containing 40% of fat as either MCT or LCT. Each patient was studied for one week on each diet in a double-blind, crossover design. The results: “Our results demonstrate that excess dietary energy as MCT stimulates thermogenesis to a greater degree than does excess energy as LCT. This increased energy expenditure, most likely due to lipogenesis in the liver, provides evidence that excess energy derived from MCT is stored with a lesser efficiency than is excess energy derived from dietary LCT.”⁸

In another study recently conducted at the School of Dietetics and Human Nutrition, McGill University, Ste-Anne-de-Bellevue, Quebec, Canada, the effects of diets rich in medium-chain triglycerides (MCTs) or long-chain triglycerides (LCTs) on body composition, energy expenditure, substrate oxidation, subjective appetite, and ad libitum energy intake in overweight men was studied. Twenty-four healthy, overweight men with body mass indexes between 25 and 31 kg/m² consumed diets rich in MCT or LCT for 28 days each in a crossover randomized controlled trial. Their conclusion: “Consumption of a diet rich in MCTs results in greater loss of AT compared with LCTs, perhaps due to increased energy expenditure and fat oxidation observed with MCT intake. Thus, MCTs may be considered as agents that aid in the prevention of obesity or potentially stimulate weight loss.”⁹

Another benefit of coconut consumption is it helps me control my blood sugar levels. Have you ever eaten any carb intensive food and had a sugar crash? Try eating some coconut oil along with the carb and it may prevent the sugar crash

or at least mitigate them. I try to keep my blood sugar level steady all day and so have a nice level energy all day, and not ups and downs all day long. I use to always be a little chubby. (wonder why?) Eating coconut does help control the chubbiness. So the direct health benefits that I have experienced from coconut oil consumption is: increased thyroid function and the blessings that brings; eliminate yeast infections; and, it also helps me control blood sugar levels. I am sure the increased thyroid function and controlling the blood sugar accounts for not being chubby anymore and the stuff tastes good in food. – Phyllis (Coconut Diet Forums)

Scientific Studies on the Weight-Loss Effects of Coconut Oil's MCTs

Scientific studies have reported that the fatty acids from MCTs in coconut oil are not easily converted into stored triglycerides, and that MCTs cannot be readily used by the body to make larger fat molecules. One animal feeding study evaluated body weight and fat storage for three different diets--low-fat diet, high-fat diet containing long-chain triglycerides (LCTs), and a high-fat diet containing MCTs. All animals were fed the selected diets for a period of 44 days. At the end of that time, the low-fat diet group had stored an average of 0.47 grams of fat per day; the LCT group stored 0.48 grams/day, while the MCT group deposited only 0.19 grams of fat per day, a 60% reduction in the amount of fat stored. The authors conclude that “the change from a low-fat diet to a MCT-diet is attended by a decrease in the body weight gain.”¹⁰

This study points out two important facts: First, when MCTs are substituted for LCTs in the diet, the body is much less inclined to store fat. Second, when we eat sensibly, a diet containing MCTs is more effective than a low-fat diet at decreasing stored fat.

In a human study, researchers compared the metabolic effects of 400-calorie meals of MCTs and LCTs by measuring metabolic rates prior to and six hours following the test meals. The results showed that the MCT-containing meals caused an average 12 percent increase in basal metabolic rate as compared with a 4 percent increase with the LCT-containing meal. The authors concluded that replacing dietary fats with MCTs could “over

long periods of time produce weight loss even in the absence of reduced [caloric] intake.”¹¹

Coconut oil is nature's richest source of MCTs. Not only do MCTs raise the body's metabolism leading to weight loss, but they have special health-giving properties as well. The most predominant MCT in coconut oil, for example, is lauric acid. Lipid researcher Dr. Jon Kabara states “Never before in the history of man is it so important to emphasize the value of Lauric Oils. The medium-chain fats in coconut oil are similar to fats in mother's milk and have similar nutraceutical effects. These health effects were recognized centuries ago in Ayurvedic medicine. Modern research has now found a common link between these two natural health products---their fat or lipid content. The medium chain fatty acids and monoglycerides found primarily in coconut oil and mother's milk have miraculous healing power.”¹² Outside of a human mother's breast milk, coconut oil is nature's most abundant source of lauric acid and medium chain fatty acids.

I've been over 100lbs overweight for 5 years. I struggled with ear and sinus infections, headaches, fatigue, high blood pressure (never been diagnosed). Everything in life seemed like work. I was miserable emotionally, mentally and spiritually. Well I've been consuming about 3-5 tablespoons of coconut oil per day and I feel amazing! I get a slight cold, but never get the secondary infection and beat the fever in 24 hours! I sleep better and wake up with a smile on my face. I'm more flexible. And I feel more at peace with my body. My spiritual life has improved and I am ready to pursue my dream of being a Christian Counselor. This has marked a pivotal change in my entire life including my marriage. This may sound silly. But I gained weight subconsciously because I didn't want to be noticed by men. And by eating better I have allowed myself to be freed from this bondage. I don't know how much I've lost, and choose not to watch the scales. But my clothes fit better, my muscles are stronger and people have noticed the loss. And now, with coconut oil, I actually have hunger pains. Our society is so focused on lowering the appetite, but a healthy appetite is good! I'm now satisfied with less food and not bound by sugar imbalance hunger. Bridgette (Coconut Diet Forums)

Over the past 18 months I've lost 107 pounds, going from 316 to 209 and from 52 to 36 pants (19 pounds to go). I lost the weight following a low carb, no sugar or grain, high saturated fat and high protein diet and eliminating ALL soy products and ALL polyunsaturated vegetable oils. I used about 2 or 3T of Virgin Coconut Oil daily. Chuck (Coconut Diet Forums)

Do All Lose Weight While Using Coconut Oil?

No. We have also had testimonies from people stating that they did not lose weight. Coconut oil is NOT a magic bullet that one can just add to their diet and sit back and watch the pounds melt away. Some people have actually done that, but most people will not see that happen. For one thing, we have had people report that they could not lose weight until they cut out all polyunsaturated fats from their diet. We have also had many women who take "the pill" report that they actually gain weight if they use coconut oil.

Also, many people have reported that while they did not lose weight, or maybe even put on a few pounds, that somehow their clothes started fitting better. We have heard this many times. Apparently Virgin Coconut Oil does help some people build muscle mass while trimming fat. Here is what one weight lifter, known as MG in the Coconut Diet Forums, reports:

Last year I was measured at 10.5% body fat. Last month, I hiked up my consumption [of Virgin Coconut Oil] from 4 tbsp /day to 6 tbsp/day. At the same time, I limited my carb intake at dinnertime. In a few weeks time, my bodyweight increased by about 4lbs. but body fat decreased to 9.6% - I did not change my workout intensity or frequency. My trainer is wondering what the heck am I taking (chest and thigh measurements increased). It blows 'em away when I say that I take Virgin Coconut Oil straight up. MG

It's VCO and low carbs. I feel better than I have in a long time, my temp is actually over 98 (not all the time, but it's better than those 94.5 readings). I'm a believer and hope to stick with it! I haven't seen a big weight loss, but my clothes fit better and I know adding an exercise program will impact the weight. Val - (Coconut Diet Forums)

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Coconut Oil: Uses and Issues on its Health and Nutraceutical Benefits

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I. Introduction: The coconut industry is one of the most important industries in the Philippines. It is the industry that brings in much needed dollars, generating a record high of US \$1.2 billion, provides livelihood for almost one-third (1/3) of the Philippine population, and yet it is an industry that is most maligned. This industry has provided financial assistance for the development of some cities, municipalities and provinces and even other industries but receives less help from the national government. Lately, with more than P100 billion worth of assets, the coconut industry has become a matter of concern for many Filipinos and to a certain extent even religious groups.

In the mid 50's, there was considerable interest in the role of dietary fats and oils in relation to the hardening of arterial walls due to cholesterol which leads to cardiovascular disease. Hundreds of studies were conducted to determine the relationship between cholesterol and heart disease but until now, scientists and medical researchers can not see any concrete evidence showing that cholesterol causes heart disease.

During the same period in the US, coconut oil (CNO) was very much used as edible oil until the issue of saturated fats in relation to cholesterol enhancing effects was highlighted. This started when a researcher from Minnesota tried to show that saturated fats really increase blood level cholesterol. He fed mice with fully hydrogenated coconut oil. Results showed that fully hydrogenated coconut oil increased the level of cholesterol. This study was reviewed by Harvard scientists who concluded that any fully hydrogenated

oils devoid of essential fatty acids when fed to animals will really cause increase in cholesterol in the blood.

To validate, another group of researchers in the US conducted a study using fresh/raw coconut oil. The results showed that raw coconut oil is neutral and does not cause an increase in the level of cholesterol. Results also showed that CNO increased the HDL level while it decreased the LDL.

Another tropical oil, palm oil, was slowly penetrating the US market getting the market share from soybean oil. US soybean interest (American Soybean Association) with the help of edible oil industry and consumer activists, the Center for Science in the Public Interest (CSPI) group, lobbied in the US Congress to subject tropical oils to pejorative labeling because of the mistaken idea that consumption of these oils (saturated fats) will increase cholesterol that leads to cardiovascular disease. Even the food-labeling rule was greatly influenced into requiring the declaration of the level of saturated fats in the product.

Until the Nutrition Labeling and Education Act of 1990 was passed into law, efforts by the government and the private interest groups in the US and to a certain extent in other parts of the world were towards discrediting coconut oil. This adversely affected our coconut industry. Everything the public has been told about vegetable oil in their dietary guidelines is half-true. Consumers were made to believe that tropical oils will clog arteries and can cause heart disease.

B. Coconut Oil Health Issues

Phil Sokolov, a US millionaire from Omaha, Nebraska, president of the National Heart Savers Association in the US and a recovered heart attack patient ran a full-page ad in the US dailies in the late 80's, which bannered "THE POISONING OF AMERICA". He accused food companies of poisoning America by using tropical oils such as coconut oil. As a result major food companies sensitive to consumer fears started to reformulate their products even to the extent of putting on their labels "no coconut oil".

Coconut oil is rich in saturated fats and many people bracket it with animal fats. In contrast

with animal fats which contain cholesterol, coconut oil, because of its vegetable source has no cholesterol. Unfortunately those who equate CNO with other saturated fats do not understand that saturated fats are of different types. There are two (2) types: medium chain (those fatty acids with carbon length of 3 to 12) and long chains (those fatty acids with carbon length of more than 12). Coconut oil is mainly composed of medium chain fatty acids (MCFA), which are easy to digest and converted to energy. They do not raise cholesterol nor increase the risk of heart disease. Animal fats are long chain fatty acids (LCFA) which have the ability to raise cholesterol and are easily stored in the body as fats.

CNO as MCFA is faster to digest and has better solubility in biological fluids. It gets absorbed readily and is carried to the liver where it undergoes rapid oxidation to release energy. This is the reason why coconut oil is preferred when cooking for people who have difficulty digesting fat. Coconut oil is used in infant milk formulation to supply fat. This facilitates absorption of calcium and magnesium essential for bone development. Mother's milk, especially the colostrum, is rich in lauric fatty acid, a major component of coconut oil. This is the one responsible for protecting the newborn baby against disease and many more.

Animal fats on the other hand have LCFAs and need pancreatic lipase to be digested. They do not mix easily with biological fluids. They bypass the liver and go around to all parts of the circulation system carrying with them a heavy load of cholesterol before going to the liver for final oxidation.

D. Doctors' Recommendation to Use Polyunsaturated Oils Like Soybean and Corn Oils

Many doctors give advice not to eat foods with saturated fats. Instead they recommend polyunsaturated oils like soybeans, corn and others. Even the United States Department of Agriculture and the United States Food Drug Administration know that these polyunsaturated oils are unstable, have short shelf-life and become rancid easily. Polyunsaturated oils have LCFA and are liquid at room temperature even inside the refrigerator. They easily combine with oxygen in air, thus becoming rancid. This reaction results

to peroxide formation that can trigger mutations or deformities in the developing fetus, or sometimes even cancer. During seizures lipid peroxidation occurs and some scientists theorize that this might be responsible for the nerve cell degeneration of Alzheimer's disease.

It is not common knowledge that the use of these oils claiming to have high content of polyunsaturated fatty acids is bad for the health as they produce large amounts of oxidants inside the body which eventually make the cells age faster and then die. To avoid this, these oils are partially hydrogenated. However, the process has proven unfavorable to the "new" oil due to the formation of trans fatty acids which are unhealthy.

A study in the US claimed that polyunsaturated oils lower the serum cholesterol. Again this research is not complete. Chemical analysis of atheroma (deposits in the inner arteries of the arterial walls) shows that fatty acids from the cholesterol esters are 74% unsaturated and 24% saturated. None were reported to contain lauric or myristic acids normally found in CNO. Since PUFA is circulating inside the body, these atheroma composed of cholesterol esters are taken into the tissues, thus findings indicate that PUFA lowers the blood cholesterol without due consideration of the tissue cholesterol. It also lowers the bad cholesterol by 24% but lowers also the good cholesterol by 41%. A higher ratio between LDL/HDL is an indication that the person is prone to cardiovascular disease or heart attack.

In order to prevent peroxidation or rancidity, the hydrogenation process is applied. Thus the natural fats known to our body become synthetic or artificial. As a result of this partial hydrogenation, the normal configuration "cis" (curved or curled structure) becomes different resulting to the formation of "trans" (straight structure) fatty acids.

When ingested, traces of trans fats can be seen in red blood cells which should not contain any. This weakens the membrane's protective structure and function, altering the transport of minerals and other nutrients but permitting entry of disease microbes and toxic chemicals.

Trans fats also derail the body's normal mechanisms of eliminating cholesterol by blocking the

normal conversion of cholesterol in the liver and contributing in the elevation of cholesterol in the blood. It also lowers the quality and quantity of milk from lactating mothers, results in low birth weight, increases the risk of diabetes, decreases levels of testosterone in males forming abnormal sperm cells.

Coconut oil, which is a Medium Chain Triglyceride (MCT), easily bypassed the digestive tract and is quickly absorbed by the liver so it can be used for energy. Other benefits from MCT are its anti-aging effect, potential anti-cancer and anti-microbial/anti viral properties.

Despite the benefits given by coconut oil, large food manufacturing companies in the US refuse to reformulate back to coconut oil even though they have personal knowledge in the potential benefits of returning to CNO. It is the public health agenda that dictates. This is because consumer and nutritionist perceptions are what drives buying. Re-educating the consumer, nutritionist and the manufacturers must be effectively directed to those people who contest the government agenda. This will be difficult because much of the control comes from ignorance and the rest from the US domestic oil industry.

III. Coconut Oil as Nutraceuticals

During the early days, coconut oil was an important part of traditional medications. People used herbs and parts of certain trees. Coconut oil concoctions applied directly to wounds or swollen areas provided quick healing. It is not only in the Philippines that these rituals have been practiced even up to the present but also in many other countries in Asia, the Pacific Islands and some parts of Africa. They believe that coconut oil has a special healing and divine power.

The word nutraceutical has been invented to define natural, standardized non-toxic dietary supplement designed to optimize health through improved nutrition. What separates nutraceuticals from an ordinary dietary supplement is that nutraceutical benefits can be substantiated with scientific facts in the prevention of chronic diseases such as cancer, heart disease and osteoporosis. It is any food or food ingredient considered to provide medical or health benefits, including the prevention and treatment of disease and at the

same time improve state of nutrition.

A. Nutraceutical Markets

The market for nutraceuticals is growing quickly worldwide and it is this global scope that particularly attracts marketers. It is estimated that the US market alone is worth some US\$250B, Europe another US\$250B, and Japan, US\$4B. Nutraceuticals have opened a host of business opportunities, economic (health care-cost savings) and quality of life opportunities.

It will be necessary to discuss nutraceuticals thoroughly with regulatory agencies to study issues, options and to determine what scientific information about nutraceutical products could be required to bring about positive, realistic regulatory changes so as to facilitate appropriate promotion and marketing of nutraceuticals based on their risk-management or disease preventive attributes.

B. Problems and recommendation

In many countries like the Philippines, present laws block important nutraceutical advances because they fall outside the traditional regulatory concept of either a food or drug.

We must also consider reducing the cost of chemical trials, which can be offset through government programs and policies.

It may be necessary to facilitate and/or coordinate the development and implementation of a multisectoral communication strategy to build awareness with respect to the wide and interesting range of nutraceutical products and the benefits they might offer.

C. Application of Coconut oil in Nutraceuticals

Coconut oil can be classified as nutraceutical product. It is rich in MCT, primarily the lauric acid (C12), and a type of fat that is proven to fight many viruses including herpes, HIV, bacteria, fungi among others. It is an excellent cooking oil. Not only can it withstand high temperature but also it does not break down easily. Its being an MCT is good for people with AIDS, and also for geriatric patients as it contributes to faster surgi-

cal recovery. Coconut oil has an advantage compared to polyunsaturated oils because consuming polyunsaturated oils can cause “acquired immunodeficiency.” It weakens the immune systems function in ways that are similar to the damage caused by radiation, hormone imbalance, cancer, aging and viral infection.

Coconut oil or its derivatives is also good for transdermal deliveries and for people suffering from chronic disease. It is even highly recommended for athletes for quick energy instead of sugars.

D. PCRDF Nutraceutical R&D’S

Even as early as 1990, PCRDF was already exploring the possibilities of finding other uses of coconut oil or its derivatives. Such studies include using CNO for the production of structured lipids. CNO is essential fatty acid (EFA) deficient. Combining CNO with EFA enriched oil at 75:25 proportion provides patients faster recovery from malnutrition and disease prevention.

In 1998, PCRDF together with San Lazaro Hospital and UNILAB conducted preliminary studies in the use of monolaurin, a monoglyceride of C12, on fifteen (15) HIV positive patients and the results gathered were very encouraging. Expanded studies involving fifty (50) HIV positive persons are currently being undertaken using monoglyceride of lauric acid from coconut oil. It has been found that monolaurin disrupts the lipid membranes of the enveloped HIV viruses. There were laboratory studies conducted showing monolaurin can also inactivate bacteria, yeast, fungi, inhibits the growth of *Helicobacter pylori* and many gram positive bacteria such as those surface skin bacteria that can cause pimples, acne, and warts. Our studies showed also that adding monolaurin to certain antibiotics could solve the problems of bacterial preventing endotoxin shock in animals. Now, a similar product is coming out but using soybean oil emulsion. Another study showed that coconut oil could prevent cancer and mutations unlike the polyunsaturated oils that can trigger cancer and mutations due to free radical formation.

In Iceland, another type of monoglycerides from coconut oil called monocaprin (monoglyceride of C10) has been found effective in destroying

AIDS Viruses. Other possible uses are against Hepatitis C, multi drug resistant TB, ulcers, etc.

For those who want to have slim bodies, coconut is highly recommended. CNO can increase the thyroid function and metabolic rate explaining why people and animals that regularly eat coconut oil are lean and healthy. It is a very good hair conditioner and can be used for body massage leaving no greasy feelings.

CONCLUDING STATEMENT:

The coconut tree provides so many things from the roots, to the trunk, flowers, fruits, leaves and the nuts. The things mentioned above are just the tip of the iceberg. It is one of the industries that can be the source of a lot of opportunities, the very same industry that others think is a sunset industry. R&D efforts will be nothing, reports like this will be insignificant unless those people that influence the policy makers and running the government are convinced so that they can directly influence the masses and consumer. Otherwise, the coconut industry will stay the same. Let us not forget that one-third of our population is directly and indirectly dependent on coconut. Pursuing and adopting these new discoveries, we can never be wrong in believing that the coconut is indeed a TREE OF LIFE.

Virgin Coconut Oil and Viruses

I haven’t had a cold in over 5 years. Just when I feel as though I coming down with something, the scratchy, sore throat symptoms....gone the next morning! I also use to get these little blisters on the bottom of my right foot. Someone told me they are some sort of herpes virus. Since using the coconut oil I don’t get these annoying little things. Usually they would surface in the summer or when the weather turned warm. But I realized this fall that I hadn’t been bothered this past summer. I believe that the coconut oil really helps ward off the virus. I also have hepatitis C and my viral counts are so low that they are almost in the undetected category. I don’t even worry about this anymore. Nancy

The antiviral, antibacterial, and antifungal properties of the medium chain fatty acids/triglycerides (MCTs) found in coconut oil have been known to researchers since the 1960s. Research

has shown that microorganisms that are inactivated include bacteria, yeast, fungi, and enveloped viruses. Much of this research is highlighted in the writings of Dr. Mary Enig Ph.D.

There is growing consensus that man-made antibiotics produced by pharmaceutical companies are over-used today, creating a whole new host of problems for modern societies. Michael Murray N.D. and Joseph Pizzorno N.D. write

There is little argument that, when used appropriately, antibiotics save lives. However, there is also little argument that antibiotics are seriously overused. While the appropriate use of antibiotics makes good medical sense, using them for such conditions as acne, recurrent bladder infections, chronic ear infections, chronic sinusitis, chronic bronchitis, and nonbacterial sore throats does not. The antibiotics rarely provide benefit, and these conditions can be effectively treated with natural measures. The widespread use and abuse of antibiotics is becoming increasingly alarming, not only because of the chronic candidiasis epidemic, but also due to the development of “superbugs” that are resistant to currently available antibiotics. According to many experts, such as the World Health Organization, we are coming dangerously close to arriving at a “postantibiotic era,” in which many infectious diseases will once again become almost impossible to treat.¹

To read more about fungal infections like Candida, and how coconut oil can help, click here.

Even if you are not taking antibiotics from your doctor, there is a good chance that you are getting plenty of pharmaceuticals through the foods you eat. There are just as many (if not more) antibiotics sold and given to animals for meat production in the US, as there are for human medicine. You say you're vegetarian? Pesticides used on crops today can also cause mutations in microorganisms similar to antibiotics. Pharmaceutical companies today produce many of the seeds used in agriculture, and they have pesticides manufactured right into them via genetic modification. Ronnie Cummins of the Campaign for Food Safety states:

When gene engineers splice a foreign gene into a plant or microbe, they often link it to another gene, called an antibiotic resistance marker gene

(ARM), that helps determine if the first gene was successfully spliced into the host organism. Some researchers warn that these ARM genes might unexpectedly recombine with disease-causing bacteria or microbes in the environment or in the guts of animals or people who eat GE food, contributing to the growing public health danger of antibiotic resistance -- of infections that cannot be cured with traditional antibiotics, for example new strains of salmonella, e-coli, campylobacter, and enterococci. EU (European Union) authorities are currently considering a ban on all GE foods containing antibiotic resistant marker genes....Gene-splicing will inevitably result in unanticipated outcomes and dangerous surprises that damage plants and the environment. Researchers conducting experiments at Michigan State University several years ago found that genetically-altering plants to resist viruses can cause the viruses to mutate into new, more virulent forms. Scientists in Oregon found that a genetically engineered soil microorganism, *Klebsiella planticola*, completely killed essential soil nutrients. Environmental Protection Agency whistle blowers issued similar warnings in 1997 protesting government approval of a GE soil bacteria called *Rhizobium melitoli*.²

Instead of relying on man-made pharmaceuticals for everything, many are now turning to natural methods to boost the body's immune system and resist harmful viruses and micro-organisms naturally. Coconut oil is truly one of nature's best “germ fighters.”

I too have had major improvement with cold and sinus symptoms. I used to chronically get bronchitis at least 3 times a year. Already this year, I have had 2 bouts of cold symptoms, and increased the amount [of Virgin Coconut Oil] to nearly 6 tbs a day thus averting the yucky sickies. I must say that I am truly impressed with this stuff. I have also seen major improvement my complexion, i.e... blackheads and breakouts. I use it directly on my face twice a day and my skin keeps looking better and better. Cheers to Virgin Coconut Oil!!! Laurie

I have hepatitis C. I was informed some time ago that the coconut oil can be a healing agent for this potentially fatal disease. I had undergone the medical treatment with interferon with no success. I was only real sick from the interfuron

treatment, lost my hair, and became severely anemic. That was about 6 years ago. In the last 4 years I began nutritional regimens noted to help/heal hepatitis c. That includes flax seed oil, milk thistle, multi vitamins, and in the last 2 years- coconut oil. My viral load was initially at 5 million-high! In the last 3 years it has gone from that to 1/20th of a million- low! My Dr. is amazed. I feel better, more energy. And most importantly I now have the belief I can watch my grand-children grow up. I believe that the coconut oil was a major ingredient that boosted this healing. It is also yummy! Gay

Lauric Acid

Lauric acid is the most predominant MCT found in coconut oil. Regarding lauric acid, Mary Enig Ph.D writes:

Lauric acid is a medium chain fatty acid, which has the additional beneficial function of being formed into monolaurin in the human or animal body. Monolaurin is the antiviral, antibacterial, and antiprotozoal monoglyceride used by the human or animal to destroy lipid-coated viruses such as HIV, herpes, cytomegalovirus, influenza, various pathogenic bacteria, including listeria monocytogenes and helicobacter pylori, and protozoa such as giardia lamblia. Some studies have also shown some antimicrobial effects of the free lauric acid.³

Lauric acid is also prominent in the saturated fat of human breast milk, giving vital immune building properties to a child's first stage of life. Outside of human breast milk, nature's most abundant source of lauric acid is coconut oil.

Just a testimonial. I learned about the purported benefits of coconut oil and lauric acid last summer on the internet. I began taking it because I had, as it turned out, been misdiagnosed, with Herpes 2. My father is a biochemist who taught medical school and graduate school for 35 years before retiring. So before I began taking it, I ran some literature by him. He was impressed so I have been taking it ever since. But my family hasn't. This October, I received a call from my eldest daughter who is in college. She had been diagnosed the day before (by blood tests) that she had mononucleosis. I checked to see if the virus (Epstein-Barr) was lipid enveloped, and found

that it was. I got on the internet and found her some Lauricedin pills and had them overnighted to her. She received them on a Wednesday and began taking the prescribed dose daily. Nine days later, a Friday, she called to tell me she was well. Subsequent blood work the following week confirmed that she was. Her other classmates who had gotten mono and had not taken monolaurin, remained sick for weeks and some were not even well by the end of the semester. I told my dad and he was impressed again. Seems like coconut oil should be the prescribed regimen for mono. David, Attorney, Memphis TN

From 1999 - 2000 a study was done at San Lazaro hospital in Manila by Conrado S. Dayrit, MD, and the affect of coconut oil and monolaurin on the viral load of HIV patients. It was found that lauric acid did bring down the viral load of HIV patients. You can read more about this study here. Dr. Dayrit is now conducting similar studies on the SARS virus, since the coconut oil consuming Philippines population was relatively unaffected by the recent SARS outbreak in China and other countries.

My roommate has been a herpes carrier for years-not the genital herpes, but my understanding is that all cases of herpes are viral, and that is the important common denominator. Virgin Coconut Oil (VCNO) is an anti-viral and breaks down what is called the "lipid envelope" surrounding the herpes cell. She initially got herpes in her eye many years ago, and it was basically dormant for several years after getting the initial episode under control. About 20 years later, it became re-activated when she acquired another herpes infection doing post mortem care on a patient in the hospital. The patient did not have a known diagnosis of herpes, but my roommate remembers cutting her finger on a piece of metal on the bed frame while giving this care. Perhaps the virus had been dormant for years on the bed. (If that is the case, and we will never know, so much for hospital cleanliness)! This time the herpes affected her spine, and she had a long bout of it, with much pain and suffering. This one was harder to get under control, and she had a few minor flare-ups. Since beginning VCNO, she has not had so much as a cold sore. Only time will tell for sure, but so far it's looking good, and she is getting other very positive results from the oil. Debby

Coconut Oil

The Healthiest Oil on Earth

By Brian Shilhavy

“Coconut oil is the healthiest oil on earth,” says Dr. Bruce Fife, a naturopathic doctor and the author of the book *The Healing Miracles of Coconut Oil*. Modern research seems to back up this bold statement. Once wrongly accused of increasing cholesterol levels, coconut oil is now actually being used by doctors in the treatment of a variety of disorders. Clinical studies have shown that coconut oil has anti-microbial and anti-viral properties, and is now even being used in treating AIDS patients. Studies conducted in the Philippines last year showed that coconut oil does indeed reduce the viral load in AIDS patients.

Lauric Acid: A Key Component to Health

Lauric acid is a medium chain fatty acid which is abundant in coconut oil and is considered responsible for many of its health benefits. Coconut oil is about 50 percent lauric acid. The only other abundant source found in nature is in human breast milk.

Dr. Jon J. Kabara, PhD. and Professor Emeritus of Michigan State University, says, “Never before in the history of man is it so important to emphasize the value of lauric oils. The medium-chain fats in coconut oil are similar to fats in mother’s milk and have similar nutraceutical effects.”

Dr. Mary Enig, a nutritionist/biochemist and one of the world’s leading authorities on fats and oils, goes on to say, “Approximately 50 percent of the fatty acids in coconut fat are lauric acid. Lauric acid is a medium chain fatty acid, which has the additional beneficial function of being formed into monolaurin in the human or animal body. Monolaurin is the antiviral, antibacterial, and antiprotozoal monoglyceride used by the human or animal to destroy lipid coated viruses such as HIV, herpes, cytomegalovirus, influenza, various pathogenic bacteria including listeria monocytogenes and heliobacter pylori, and protozoa such as giardia lamblia. Some studies have also shown some antimicrobial effects of the free lauric acid.”

The Politics of Tropical Oils

So why has coconut oil gotten such a bad rap in the recent past? After all, much of the research supporting coconut oil as a healthy fat has been around for some time. The answer is politics and economics. Coconut oil was heavily used in the U.S. at one time, being used for baking, pastries, frying, and theater popcorn. But starting in the 1980s, some very powerful groups in the U.S. including the American Soybean Association (ASA), the Corn Products Company (CPC International), and the Center for Science in the Public Interest (CSPI) began to categorically condemn all saturated oils. Faulty science was used to convince the public that ALL saturated fats were unhealthy, when in fact saturated fats rich in the medium-chain fatty acids like lauric acid are very healthy.

These organizations were aided by the United States Food and Drug Administration (FDA), many of whose key personnel are recruited from and return to the vegetable oil industry. The result was that most people switched to vegetable oils, and the main source of lauric acid from tropical oils in the American diet was lost. The countries that these tropical oils came from, mainly the Philippines and Malaysia, were too poor to counter these untrue claims with advertising investments for the truth. It is only recently that the health benefits of these tropical oils are starting to become rediscovered.

Population Studies

While some clinical studies have been conducted recently, such as the study on AIDS patients in the Philippines (1999 - 2000), much of the studies have been done on tropical populations where coconut products are a main part of the diet. One such study was done in the South Pacific islands of Pukapuka and Tokelau near New Zealand. The studies were started in the 1960s before either island was exposed to Western refined food. These populations ate only natural foods, and coconut foods were the most prevalent, being consumed at each meal in one form or another. While most people in western countries get 30-40 percent of their calories from fats, the people in these islands averaged between 50 and 60 percent of their calories from fat, most of that

being saturated fat from coconuts.

So what kind of health did these studies find among the populations in these two islands? Bruce Fife reports in his book: “The overall health of both groups was extremely good compared to Western standards. There were no signs of kidney disease or hypothyroidism that might influence fat levels. There was no hypercholesterolemia (high blood cholesterol). All inhabitants were lean and healthy despite a very high saturated-fat diet. In fact, the populations as a whole had ideal weight-to-height ratios as compared to the Body Mass Index figures used by nutritionists. Digestive problems are rare. Constipation is uncommon. They average two or more bowel movements a day. Atherosclerosis, heart disease, colitis, colon cancer, hemorrhoids ulcers, diverticulosis, and appendicitis are conditions with which they are generally unfamiliar.”

A fat that causes weight loss?

Another incredible fact about coconut oil is that even though it is a fat, it actually promotes weight loss! The reason is again because of the healthy medium-chain fatty acids. These fatty acids do not circulate in the bloodstream like other fats, but are sent directly to the liver where they are immediately converted into energy, just like carbohydrates. So the body uses the fat in coconut oil to produce energy, rather than be stored as body fat. Medium-chain fatty acids found in coconut oil also speed up the body’s metabolism burning more calories and promoting weight loss. The weight loss effects of coconut oil have clearly been demonstrated by many researchers. (A list of references can be found in Bruce Fife’s book *The Healing Miracles of Coconut Oil*.)

Therapeutic Dosage

So how much coconut oil should one consume? A good therapeutic dosage is 3 to 4 tablespoons a day. This provides enough lauric acid to build the immune system. Also, look for unrefined coconut oil. Stay away from all hydrogenated oils, whether it is coconut oil or vegetable oils. Hydrogenated oils are oils with trans-fatty acids, which have been altered from their original chemical composition and have been shown to raise serum cholesterol levels that can lead to heart disease.

Also look for unrefined coconut oils like Virgin Coconut Oil. Most commercial coconut oils are RBD (refined, bleached, and deodorized). While these RBD oils do maintain the beneficial chemical structures of the medium chain fatty acids, they also contain chemicals used in processing.

THE PLAIN TRUTH ABOUT COCONUT OIL

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(Quoted from the Jakarta Post, June 18, 2003)

On March 19, 2003 the Jakarta Post published an article entitled “The simple truth about cholesterol” written by Melissa Southern-Garcia. While the article tries to enlighten readers about cholesterol, it is sad to note that the author gave inaccurate and misleading information about coconut oil. She implied that since coconut oil belongs to saturated fat it has a negative effect on our health by increasing our blood level of harmful LDL (Low Density Lipoprotein) cholesterol. This article is meant to give a scientifically proven fact about coconut oil that may be missed out by common people and professionals.

Coconut oil is a colorless to pale brownish yellow oil with a melting point ranging from 23°C to 26°C. The glycerides of coconut oil are invariably a mixture of one, two, or three fatty acids. Though coconut oil is known as triglyceride or lipid, it also contains minor proportions of mono and diglycerides and has highest content of glycerol (13.5% to 15.0%). Glycerol is a carbohydrate with chemical composition similar to that of simple sugar. This implies that with coconut oil as a dietary fat, the actual intake of fatty substances is much less than that with same quantity of any other actual intake of any other oil.

A study done in a two groups of community living in New Zealand who consume a large number of coconut oil has proved that they have rare incidents of hypercholesterolemia and heart attack. According to Prior, Davidson et al. two groups of Polynesians from Cook Islands derive 35% and 27% of their calories from coconut oil but their mean cholesterol values are low, i.e. 153 mg% and 195 mg% respectively. Prevalence of heart attacks also is low in these groups compared to

the usual New Zealand population.

About 70% Sri Lankans are consuming coconut oil for over 1000 years but the epidemic of hypercholesterolemia and heart disease is of recent origin. Before 1950, heart attacks were not common in Sri Lanka. Hospital admission rate for heart attacks was 57.3 in 1970 to 182 in 1992. On the other hand the Central Bank of Sri Lanka figures out that the coconut consumption has gone down from 132 nuts per person per year in 1952 to 90 per person per year in 1991. It indicates that the increase of heart attacks incidents in Sri Lanka is not due to the increased consumption of coconut.

In a study in the Philippines, 10 medical students tested diets consisting of different levels of animal fat and coconut oil. When the ratio of animal fat and coconut oil at ratio of 1:1, 1:2, 1:3 no significant change in cholesterol but when animal fat level increased total calories reached 40% and blood cholesterol increased. This study indicated that not only did coconut had no effect on cholesterol levels, it even reduced the cholesterol elevating effect of animal fat.

Hashim et al (1953) demonstrated that coconut oil was not a "bad oil" when they compared essential fatty acid-rich safflower oil with an equal mixture of safflower oil and coconut oil on 10 hypercholesterolemia males, 8 of whom were survivors of myocardial infarction. They showed that both safflower oil (SFO) and safflower oil-coconut oil (SFO-CNO) caused marked decrease in the serum cholesterol and that the (SFO-CNO) effect was obtained regardless of whether it was fed before or after the safflower oil (Kaunits, 1992).

There were some experiments which concluded that coconut oil caused hypercholesterolemia, but these experiments turned out to be unacceptable due to some reasons. First, these experiments used hydrogenated coconut oil in which the coconut oil became more saturated and its essential fatty acid, linoleic fatty acid, got destroyed. Second, Most of the research work has been done using animals such as rabbits, monkeys, dogs, swine, and rats and the number of animal used are very small. In some experiments only four animals were used. Third, Rabbit model used for most of the research work cannot be compared to man. It has been found that when corn oil is

administered to a man it will make his serum cholesterol level come down, while in the rabbit model, corn oil increases serum cholesterol level (Aturokarole, 1996).

The fact that coconut oil belongs to saturated oil cannot be automatically justified to be the cause of increasing LDL cholesterol as coconut oil has its own unique properties. Moreover, people may not know what saturated oil means. Chemically, oil is made up of chains of carbon, hydrogen and oxygen called fatty acid. All fatty acids consist of a chain of carbon atoms with varying amounts of hydrogen atoms attached to them. A molecule that has two hydrogen atoms attached to each carbon is said to be "saturated" with hydrogen because it is holding all the hydrogen atoms it possibly can. A fatty acid that is missing a pair of hydrogen atoms on one of its carbons is called monounsaturated fat. If more than two hydrogen atoms are missing, it is called polyunsaturated fat. (Fife, 2000).

It must be noted that there are different groups of fatty acids contained in major oils and fat. Generally they are grouped into medium chain fatty acids (MCFA), and long chain fatty acids (LCFA). The two fatty acids have different behavior and health effect to human being. Those who equate coconut oil with other saturated fats are not conscious of the existence of subgroups within broad category of saturated fatty acids. The medium fatty acids have a lower melting point, a smaller molecular size and greater solubility in water and biological fluids compared with those of the long chain fatty acids (Thampan, 1998).

Coconut oils is grouped into MCFA as 57% its fatty acids consisting of C8 (capric acid) and C12 (lauric acid). A number of noted scientists have revealed the superiority of MCFA. Coconut oil has approximately 50% lauric acid. Lauric acid has the additional beneficial function of being formed into monolaurin in the human or animal body. Monolaurin is the antiviral, antibacterial, and antiprotozoal monoglyceride used by the human or animal to destroy lipid-coated viruses such as HIV, herpes, cytomegalovirus, influenza, various pathogenic bacteria, including listeria monocytogenes and helicobacter pylori, and protozoa such as giardia lamblia. Some studies have also shown some antimicrobial effects of the free lauric acid. (Enig, 1999).

Coconut oil has also, approximately 6-7% capric acid. Capric acid has a similar beneficial function when it is formed into monolaurin in the human or animal body. Monolaurin has also been shown to have antiviral effects against HIV and is being tested for antiviral effects against herpes simplex and antibacterial effects against chlamydia and other sexually transmitted bacteria. (Reuters, London June 29, 1999).

Garcia who stated in her article that vegetable oils did not have cholesterol is not accurate. The latest research finding concludes that cholesterol can also be found in vegetable oils. INFORM Vol. 13 December 2002 published by American Oil Chemists' Society indicates that vegetable oils contain cholesterol although in small amounts. It is further stated that coconut oil has the lowest cholesterol amounts (5-24 parts per million) compared to palm kernel oil, sunflower oil, palm oil, soy oil, cottonseed oil, rapeseed oil, and corn oil. Please see table 1.