

# Paradox

The Omega Oil  
with a difference

# *Paradox Omega Oil*

**A NEW AND UNIQUE CONCEPT IN OMEGA FATTY ACID  
SUPPLEMENTATION**

***Dr. Geoff Hayhurst BDS.(Vic.Univ.Man.) DO.***

***31 March 2005***

## **The Initial thought process**

*Although Paradox's key 'marketing' messages in general terms are about the benefits of both the Mediterranean and Eskimo diets, Geoff's thought processes on the formulation of Paradox and therefore its therapeutic efficacy were based on extensive reviews of the literature which included epidemiological studies and clinical research trials. These studies were further backed up with his own patients' experiences spanning some 20 years of clinical practice and finally his pilot study conducted in 2005.*

## **History**

*Omega fatty acids are some of the most widely studied food stuffs in recent history. After the Second World War food scientists became interested in populations who consumed large amounts of fat but paradoxically suffered less from the diseases which were starting to ravage western societies. Two major epidemiological studies in contrasting parts of the globe backed up these initial findings and it was from these studies that Geoff became interested in the so called "Omega" good fats contained in the Eskimo and Mediterranean diets.*

*The pioneering works of Hugh MacDonald Sinclair at Oxford University in the 1950s and Bang and Dyerberg in Greenland in the 1970s lead to an explosion of research into the health benefits of Fish oils. At the same time Ancel Keys a respected American Nutritionist was discovering as part of his "Seven Countries Study" that The Cretan diet based heavily on Olive oil lead to extremely low rates of mortality from cancers and heart disease in men.*

*Geoff therefore undertook an extensive review of the literature involving many aspects of 'Omega' research. He did this initially as a basis to try and make an Omega supplement which would be beneficial to his patients suffering from musculoskeletal disorders who were seemingly not getting any benefit from taking their 'Omega' products. After some time noting his patient's experiences his conclusions were that the non benefits of his patients' supplements were due to three key factors.*

- 1) Patients were not taking supplements on a regular basis or for long enough**
- 2) Patients were not taking large enough therapeutic doses**
- 3) Patients were taking supplements containing poor quality/ rancid oils**

*The fundamental thought processes were then established to try to initially make a liquid Omega supplement that was not only therapeutically dose related but was both palatable and remained stable and therefore would not go rancid, allowing his patients to gain the maximum health benefits . Compliance is fundamental if the patient is going to benefit from any medicine and Paradox was developed with this key factor in mind. Geoff realised the simple fact that if people could not take their medicine then how could they ever gain the benefits?*

### **The case for fish oils as the source of Omega 3 in Paradox Oil**

*Geoff reviewed the “Omega” literature and looked at the chemistry of many oils (fish, nut and seed) before deciding upon his formulation. Dietary Omega-3 essential fatty acids can be obtained from either of two sources:*

- 1. Land plant foods (grains, seeds, oils, fruits, and vegetables) or*
- 2. Aquatic plants (algae, plankton, and seaweed) and animals (fish, shellfish, and zooplankton).*

*The fish are in reality only collectors of Omega 3's. All the marine Omega 3 fatty acids come intact from plants (algae at the base of the food chain.)*

*It is also important to know that the base fish oils we use in Paradox Oils are derived from sustainable fisheries. No animal is killed specifically to extract these oils. As a point of ecological interest, there is also a growing body of opinion that believe that the ecological foot print of fish oil is thought to be considerably much less than that of the mass cultured oils from plant sources which unfortunately utilise the ecologically disastrous “cut and burn” methodology of farming.*

### **Animal vs. Vegetable sources of Omega 3**

*The most widely available source of EPA and DHA is cold water fish such as deep sea cod, wild salmon, herring, mackerel and sardines. Oils from these Fish have a profile of around seven times as much omega 3 as omega 6. Historically Eskimos have obtained the majority of their food from animal sources without it they would simply not survive as their environment could never support a plant only based diet.*

*Flax (linseed) and its oil are perhaps the most widely available botanical source of omega-3. Flaxseed oil consists of approx. 55% ALA (alpha-linolenic acid). Flax contains approximately three times as much omega-3 as omega-6. The problem with botanical oils (few of which contain Omega 3s in a ready made bio-available form) is that ALA is a short chain omega-3 fatty acid and needs to be converted to the longer chain EPA/DHA to be therapeutically useful.*

*Studies have reported that conversion of ALA to EPA and further to DHA in humans is limited, at an efficiency of (2%-15%) but varies with individuals. It may be noted women have higher ALA conversion efficiency than men, probably due to the lower rate of utilization of dietary ALA for beta-oxidation or women hormone factors, however conversion rates are statistically very poor and therefore to get the essential omega 3 fatty acids EPA and DHA pure deep sea fish oils from a known and highly reputable source oil were chosen as the base oil in Paradox.*

## **Omega fatty acid ratios**

Furthermore clinical studies indicate that the ingested ratio of omega-6 to omega-3 fatty acids is important to maintaining health. Both omega-3 and omega-6 fatty acids are essential, i.e. humans must consume them in the diet. Omega-3 and omega-6 compete for the same metabolic enzymes, thus the omega-6:omega-3 ratio will significantly influence the ratio of the ensuing eicosanoids (prostaglandins, leukotrienes, thromboxanes), and will alter the body's metabolic function. This necessitates that omega-3 and omega-6 be consumed in a balanced proportion. Healthy ratios of omega-6: omega-3 range from 1:1 to 4:1. Studies suggest that the evolutionary human diet, rich in seafood and other sources of omega-3, may have provided such a ratio. Unfortunately nowadays typical Western diets provide ratios of between 10:1 and 30:1 - i.e., dramatically skewed toward omega-6, encouraging the production of the detrimental to health, series 2 pro inflammatory prostaglandins.

Paradox oil was formulated to address this balance having a ratio of 5:1 of omega 3 to omega 6.

## **Natural vs. Synthetic Fish Oil**

Many nutritional supplements come in an array of competing forms, and their marketers strive to convince consumers that their product offers superior absorption or efficacy. The long list of controversies includes Vitamin C (ascorbic acid vs. ester C), Calcium (carbonate vs. citrate), and Echinacea (*E. purpurea* vs. *E. angustifolia*).

What about omega fatty acids? We have explained the several important distinctions between plant-source and marine omega-3s above, but there are also distinctions among fish oil based supplements which may have a bearing on their bioavailability and thus their therapeutic efficacy.

Omega-3's from fish oil (EPA and DHA) come to consumers attached to one of two kinds of molecules—triglyceride esters or ethyl esters. In nature Omega-3 triglycerides are esters formed from the joining of glycerol to three omega-3 fatty acids. The ethyl ester form of omega-3s found in the large majority of fish oils in the market place are the results of EPA and DHA being extracted from their NATURAL glycerol structure by means of "trans esterification" with ethanol. The body does recognize both forms (triglyceride or ethyl ester) of fish-derived omega-3s, and it uses enzymes to metabolise omega-3s from either package as needed to serve different metabolic functions.

**Almost ALL of the long-chain omega-3-fatty acids (EPA and DHA) in FISH and in PARADOX occur in the triglyceride form – AS NATURE INTENDED**

**In contrast, most of the fish oil supplements in the market place contain the ethyl ester form of omega-3s.**

*This is because most fish oil supplement makers put their oil through a process called molecular distillation. The chief purpose of molecular distillation is to remove the industrial contaminants (e.g., heavy metals, dioxins and PCBs) present in the fish oils and concentrate the "star" omega-3 molecules, EPA and DHA, thus removing some or many of the other fatty acids which make up and balance the Whole Oil. In this model sterility overshadows efficacy, and potency surpasses natural balance and wholeness (the "potency" acquired via concentrating the omega-3s in fish oil may be inconsistent or even illusory .as studies show they are rendered less bio available)*

*Molecular distillation removes omega-3-fatty acid molecules, intact, from their natural glycerol companion molecule via a total process called re-esterification, which places the omega-3s in an ethyl ester package. In most cases, molecular distillation involves flash-heating the oil to high temperatures (about 260° centigrade) in the presence of a vacuum .In our opinion this exacts an excessive strain on the fatty acids' molecular structure. Some call ethyl ester omega-3s synthetic.*

*By contrast, the patented purification processes for the Fish oil used as a base in PARADOX do NOT put the fatty acid molecules in the Whole oil under the same stresses and pressures of temperature and the consequential separation of the balancing fatty acids.*

### ***Does this more Natural State of Omega-3 make a difference?***

*Natural fish oils exhibited better absorption/bioavailability in four head-to-head trials. Results were mixed among the four clinical studies that compared the two forms of supplemental omega-3s, but the NATURAL form came out ahead, overall;*

*There were a number of clinical studies designed to determine which form is better absorbed by the human body. In each case, the investigators gauged absorption rates by looking at the blood levels of EPA and DHA that result from ingesting the two divergent forms of marine omega-3s: the ethyl ester form in most capsules /oils on the market, and the triglyceride form that occurs naturally in Fish and PARADOX.*

- *Two studies produced neutral results, with the two forms of omega-3s absorbed equally well.*
- *Two studies showed that triglyceride omega-3s produce substantially higher blood levels of omega-3s.*

### **Stabilizing the reactive Omega fatty acids**

*Palatability was fundamental if the oil were to succeed- “you can take a horse to water” .... The overriding reason for oils not being palatable is rancidity. Cure the problem of rancidity (oxidation of the very unstable double bonds in the omega fatty acids) and at a stroke you have oil which is not only palatable but remains stable in its molecular structure and therefore must be more therapeutic.*

*The advantages of using antioxidants in the food industry are widely recognised. Antioxidants are able to protect food products from oxidation thereby maintaining their quality and product characteristics. Recently as a result of the focus on healthy foods there has been a strong increase in consumer interest in natural antioxidants.*

*The majority of the finished products that contain fish oil are currently stabilized with dl-alpha tocopherol or mixed tocopherols (ie. Vitamin E) which although offering some protection from oxidation have been shown to be insufficient when it comes to eliminating all off flavours.*

*The lipophilic polyphenols in first cold pressed olive oil – (up to 5mg of antioxidant polyphenols in every 10g) are natural antioxidants which have been shown to have a host of beneficial effects. Many other nut and seed oils have no polyphenols. There is a growing body of evidence revealing the unique antioxidant activity of this family of compounds, against the oxygen – derived free radicals in pathological processes especially lipid oxidation.*

*Recent research is showing that it is now clear that the health benefits of extra virgin olive oil in the promotion of healthy breast tissue, colon function, cardiovascular function and other health states can be attributed both to the abundance of the monounsaturated fatty acid – **Omega 9 Oleic Acid** (Approx. 85% of oil) contained in extra virgin olive oil and to the strong antioxidant activity of its polyphenols.*

*Hydroxytyrosol is the olive natural polyphenol with the highest level of free radical protection activity ever reported for any natural fat soluble antioxidant compound. (ORAC scale).*

*Newly pressed extra virgin olive oil also contains olecanthal a substance now found to have the same pharmacological activity as conventional non steroidal anti –inflammatory medicines both of which inhibit the same cyclooxygenase enzymes in the prostaglandin- biosynthesis pathway.*

## **Conclusion**

*It became clear that formulating the new Omega supplement from a blend of pure high quality natural Fish Oil obtained from sustainable fish stocks (purified by a patented system) natural fat soluble antioxidants and fatty acids from cold first pressed Extra Virgin Olive Oil with a high polyphenol content would go a long way to satisfying the fundamental thought processes that Geoff initially had. In addition a small amount of pure lemon oil was then added into the formulation both to enhance the palatability and to increase the natural antioxidant effect. Once these key considerations had been established Geoff spent a considerable amount of time in developing the optimum therapeutic formula using his patients and their feedback to further refine the blend.*

*A copy of the pilot study is also enclosed.*

## **Selected references;**

- 1 Ansel Keys - Seven Countries – A multivariate Analysis of Death and CHD – 1980 Harvard Univ Press
2. Bang Dyerberg – Fatty acid composition of plasma lipids in Greenland Eskimos - Journ. of Amer. Nutrition 1975 vol.28
3. Fine wines and fish oil – The Life of Hugh MacDonald Sinclair – Oxford Univ Press 2001
4. 1998 Batram encyclopedia of Herbal Medicine  
Thomas Batram
- 5 Omega6/Omega3 EFA Ratios – The Scientific Evidence 2003  
.Simopoulous AP Cleland AG
6. Seed oil Fatty Acids –  
SOFA Database
7. Ho Cosmas Comparing Omega 3 FAs from Fish oil and Flax seed oil –  
Oct - 2007-
8. European Journ. of Clinical Nutrition –Nov 2002- Tyrosol /Hydroxytyrosol are absorbed from moderate and sustained doses of virgin olive oil in Humans
9. Nature- - Ibuprofen –like activity in extra virgin olive oil  
Sept 2005 Beauchamp et.al
10. Antioxidants in Mediterranean Diets -  
Viscoli F ; World Rev Nutr Diet 2000 vol 87
11. E Kulas, E Olsen Effect of Tocopherols on the distribution of volatile secondary oxidation products in Fish Oil  
Eur. Jour. of Lipid Sci. vol 104 2002
12. Effects of Omega-3 Fatty Acids on Cancer

Authors: MacLean CH, Newberry SJ, Mojica WA, Issa A, Khanna P, Lim YW, Morton SC, Suttorp M, Tu W, Hilton LG, Garland RH, Traina SB, Shekelle PG

13 Effects of different doses of fish oil on rectal cell proliferation in patients with sporadic colonic adenomas.

*Gastroenterology*. 1994 Dec;107(6):1709-18.

Anti M, Armelao F, Marra G, Percesepe A, Bartoli GM, Palozza P, Parrella P, Canetta C, Gentiloni N, De Vitis I, et al. Department of Internal Medicine, Catholic University of Rome, Italy

14. Effect of omega-3 fatty acids on rectal mucosal cell proliferation in subjects at risk for colon cancer

Anti M, Marra G, Armelao F, Bartoli GM, Ficarelli R, Percesepe A, De Vitis I, Maria G, Sofo L, Rapaccini GL, et al.

Department of Internal Medicine, Catholic University of Rome, Italy.

### Additional References

1. Conversion of ALA to longer chain PUFAS in human adults (Y)  
Burdge G C Calder P C – *Reprod. Nutr. Dev* 2005 sept -oct
- 2 Long Chain PUFA Plant v Marine sources (Y)  
Williams CM Burdge G
- 3 Fish omega 3 and Human Health AOCS Press 2005  
Lands William EM
- 4 Can adults adequately convert alpha-linolenic acid (18:3n-3) to eicosapentaenoic acid (20:5n-3) and docosahexaenoic acid (22:6n-3)  
Gerster H Vitamin Research Department, F. Hoffman-Roche Ltd, Basel, Switzerland
- 5 Conversion of alpha-linolenic acid to longer-chain polyunsaturated fatty acids in human adults. Burdge GC, Calder PC.  
*Reprod Nutr Dev*. 2005 Sep-Oct;45(5):581-97.
- 6 Comparison of the effects of linseed oil and different doses of fish oil on mononuclear cell function in healthy human subjects. Wallace FA, Miles EA, Calder PC. Institute of Human Nutrition, School of Medicine, University of Southampton
- 7 Maternal seafood consumption in pregnancy and neurodevelopmental outcomes in childhood (ALSPAC study): an observational cohort study. Hibbeln JR, Davis JM, Steer C, Emmett P, Rogers I, Williams C, Golding J. US Laboratory of Membrane Biophysics and Biochemistry
- 8 Fish and omega-3 fatty acid intake and risk of coronary heart disease in women. Hu FB, Bronner L, Willett WC, JAMA. 2002 Apr 10;287(14):1815-21  
Stampfer MJ, Rexrode KM, Albert CM, Hunter D, Manson JE.  
Department of Nutrition, Harvard School of Public Health

- 9 Fish consumption and risk of stroke in men. He K, Rimm EB, Merchant A, Rosner BA, Stampfer MJ, Willett WC, Ascherio - Department of Nutrition, Harvard School of Public Health  
Journal of the American Medical Association ( JAMA) . 2002 Dec 25;288(24):3130-6. Links
  
- 10 American Journal Clinical Nutrition. 2007 May;85(5):1267-74.  
Combining fish-oil supplements with regular aerobic exercise improves body composition and cardiovascular disease risk factors. Hill AM, Buckley JD, Murphy KJ, Howe PR.-Nutritional Physiology Research Centre and the Australian Technology Network Centre for Metabolic Fitness
  
- 11 Nutr Health. 2006;18(3):233-47  
The role of dietary fatty acids in children's behaviour and learning. Portwood MM.  
Educational Psychology Service, DCC Education Development Centre, Co Durham
  
- 12 Omega-3 fatty acids in ADHD and related neurodevelopmental disorders. Richardson AJ.  
Department of Physiology, Human Anatomy and Genetics, University of Oxford,
  
- 13 Fish oil induced increase in walking distance, but not ankle brachial pressure index, in peripheral arterial disease is dependent on both body mass index and inflammatory genotype. Madden J, Brunner A, Dastur ND, Tan RM, Nash GB, Rainger GE, Shearman CP, Calder PC, Grimble RF.  
Institute of Human Nutrition, School of Medicine, University of Southampton, and Department of Vascular Surgery, Southampton General Hospital, Southampton, Prostaglandins Leukot Essent Fatty Acids. 2007 Jun;76(6):331-40. Epub 2007 Jun 27. Links
  
- 14 Food omega-3 fatty acid intake of individuals (total, linolenic acid, long-chain) and their blood pressure: INTERMAP study. Ueshima H, Stamler J, Elliott P, Chan Q, Brown IJ, Carnethon MR, Daviglus ML, He K, Moag-Stahlberg A, Rodriguez BL, Steffen LM, Van Horn L, Yarnell J, Zhou B; INTERMAP Research Group.  
Department of Health Science, Shiga University of Medical Science 2007 Aug;50(2):313-9. Epub 2007 Jun 4
  
- 15 A review of omega-3 ethyl esters for cardiovascular prevention and treatment of increased blood triglyceride levels. von Schacky C. Medizinische Klinik and Poliklinik Innenstadt, University of Munich 2006;2(3):251-62

- 16 Omega-3 fatty acids and cardiovascular disease: a case for omega-3 index as a new risk factor. Harris WS.  
Nutrition and Metabolic Disease Research Institute,  
Sanford 2007 Mar ;55(3):217-23. Epub 2007 Jan 25.
- 17 Am J Clin Nutr. 2007 May;85(5):1392-400  
Effects of fish-oil and folate supplementation of pregnant women on maternal and fetal plasma concentrations of docosahexaenoic acid and eicosapentaenoic acid: a European randomized multicenter trial. Krauss-Etschmann S, Shadid R, Campoy C, Hoster E, Demmelmair H, Jiménez M, Gil A, Rivero M, Veszprémi B, Decsi T, Koletzko BV

## **A PILOT STUDY:-**

### **“SUPPLEMENTATION WITH PARADOX OIL, AN OMEGA 3. 6. 9 FATTY ACID FOOD SUPPLEMENT CONTAINING A BLEND OF OMEGA FISH OIL AND HIGH POLYPHENOL OLIVE OIL.”**

Dr G. A. Hayhurst BDS. DO. Sept.2005

#### **Objective:**

To evaluate whether paradox oil , a fatty acid supplement containing fish oil and extra virgin olive oil could improve clinical parameters of patients with inflammatory and degenerative joint disease.

#### **Method:**

21 patients, (13 female, 8 male) all who had previously taken “cod liver oil” or “fish oil” in liquid / capsule forms for periods of more than 3 months without any significant benefits, were asked to supplement their diets daily with one 10 ml oral dose of paradox oil. None of their prescription medication was altered and they were asked to make no significant changes in their diets.

Assessment of clinical parameters only was made at 6 weeks / 12 weeks. No lab. tests were used.

#### **Clinical parameters:**

1. Morning stiffness.
2. Reactions to light housework / gardening etc.
3. Walking distance.
4. Range of lumbar flexion /cervical rotation.
5. Subjective assessment of the patients own general wellbeing.

#### **Results:**

1 female patient failed to take the oil as she found it unpalatable .From the rest of the trial group, 13 patients showed or described moderate to significant improvements in all the above clinical parameters after 6 weeks and 16 patients showed or described enhanced improvement in all the clinical parameters after 12 weeks .10 patients remarked on improvements in general wellbeing, i.e. (less tired; better sleep patterns; skin /hair healthier; less mood swings) which were not apparent before supplementation. 3 patients who by coincidence had “blood cholesterol” checked while on the supplement had a

significant mean reduction; 17% in low density lipoproteins and significant mean reduction; 21% in triglycerides.

## **Discussion:**

Paradox oil is a new and unique food supplement which blends together long-chain fatty acids from fish oil with those contained in extra virgin olive oil.

Fatty acids are long chain hydrocarbon molecules containing a carboxylic acid moiety at one end. All fatty acids, whether saturated, monounsaturated or polyunsaturated contain a high density of carbon and hydrogen atoms. When they are consumed as food they yield a lot of food energy and this is their primary role in the diet. Unsaturated fatty acids tend to be spared this fate because the presence of one or more double bonds between the carbon atoms in the carbon-hydrogen chain allows the human body to utilize them and do things it can't do with saturates, thus giving mono and polyunsaturated fatty acids much more important roles in maintaining health.

Three major roles of fatty acids.

1 As a source of energy.

2 As a structural component in cells and cell membranes.

The properties of the cell membrane and its internal structures depend on the make up of the fatty acids within it. A cell will only therefore respond in the optimal manner to stimuli, if the membrane surrounding it is composed of the optimal mixture of fatty acids.

3 As the raw material to make biological regulators.

Chemical messengers which control many different body processes in a number of body systems.

The two most studied fatty acids in fish oils are from the omega 3 family, (the position of the first double bond is at the third carbon atom counting from the methyl end of the chain); the 20 carbon eicosapentaenoic acid (EPA; C<sub>20</sub>:<sub>5</sub>n-3) and the 22 carbon docosahexaenoic acid (DHA; C<sub>22</sub>:<sub>6</sub>n-3). EPA has five double bonds and is capable of being elongated or metabolized into a range of biologically active substances referred to generically as eicosanoids. DHA has six double bonds in the chain and its role is more significant as a structural component of cells especially in the brain and retina of the eye. DHA plays a unique role in the building of these tissues in the foetus and its abundance in breast milk shows its importance in neonatal development.

Oleic acid, an omega 9 monounsaturated fatty acid (C<sub>18</sub>:<sub>1</sub>n-9) makes up to 85% of extra virgin olive oil. Recent research is confirming the well documented epidemiological evidence that this monounsaturated fatty acid has benefits in cardiovascular health as well as a number of other body

systems. It may be a key reason why eating a Mediterranean diet reduces the risk of breast cancer as oleic acid has been shown to reduce the expression of the Her-2/neu oncogene which is associated with the aggressive form of this disease.

Linoleic acid (C18; 2n-6) an omega 6 polyunsaturated fatty acid makes up to 10% of extra virgin olive oil. This fatty acid is the starting material for the omega 6 derivatives. First it is turned into gamma – linolenic acid (GLA 18; 3n-6), then by processes involving enzymes and catalysts to longer chain fatty acids which have similar actions and mechanisms to the omega 3 fats. They therefore play important roles in cardiovascular health and demonstrate anti-inflammatory effects. Studies show that they can increase thermo genesis, therefore burning more fat .They also play a role in sympathetic nervous system stimulation.

High quality extra virgin olive oil (less than 0.5% “free fatty acids”) was blended with refined pure cod liver/fish oil from a known and reputable source.

Paradox oil contains the following therapeutic and essential long chain monounsaturated and polyunsaturated fatty acids.

Per 10 ml dose:

1. E.P.A. (eicosapentaenoic acid) omega 3 = 700mg
2. D.H.A (docosahexaenoic acid) omega 3 = 750mg
3. Linoleic acid omega 6 = 300mg
4. Oleic acid omega 9 = 4000mg

A mass of epidemiological and specific research papers have demonstrated the wide ranging health benefits of the above” good fats.” Could there be enhanced or synergistic benefits by blending the good fats contained in fish oil and olive oil along with their natural vitamins, phytochemicals and antioxidant stabilizers?

EPA, DHA and oleic acid have been shown to have several actions in a number of body systems. In the cardiovascular system EPA, DHA and oleic acid lower elevated triglycerides and low density lipoproteins (by inhibition of lipogenesis and stimulation of fatty acid oxidation in the liver). They have also demonstrated anti-arrhythmic properties, the exact mechanism for this is unclear but it seems likely that it is due to the increased presence of these fatty acids in the cell membranes of the heart giving them greater permeability.

EPA, DHA and Oleic acid have been demonstrated to have anti-inflammatory and immune modulating properties giving obvious benefits in prolonging bone and joint health as well as in other diseases involving inflammatory and immune responses. Several mechanisms are thought to account for these phenomena. These fatty acids inhibit the conversion of arachidonic acid to the pro-inflammatory eicosanoids (E2 prostaglandins) and leukotrienes. Inhibition

of inflammatory cytokines, TNF –alpha and IL 1-beta, seems to be another mechanism in suppressing the inflammatory pathways.

A diet rich in these fatty acids has been shown to increase insulin sensitivity thus improving blood sugar control and promoting the consequential anabolic effects, with increased liposis and fewer tendencies to become diabetic.

DHA is vital for normal brain development in the foetus and for maintenance of normal brain function throughout life, being a major determinant of membrane fluidity in brain cells. Along with EPA this seems to play a major role in normal cognitive function and mood. Diets rich in oleic acid have also demonstrated increased cognitive function in the elderly.

More recently these fatty acids have been involved in studies to determine their ability to suppress cancer cells. In vitro and animal studies have shown EPA, DHA and oleic acid to suppress neoplastic transformation, inhibit cancer growth, and enhance apoptosis and to have anti angiogenic activity. A common mechanism underlying the anti-cancer effects of the above fatty acids could be their role in modulating eicosanoid production and activity.

Optimum health of course relies on the correct balance of fatty acids. Unfortunately recent evidence implies that modern western diets provide at least 10 times more omega 6 fatty acids than omega 3 thus competing for enzymes involved in their metabolic interconversion. This problem is further compounded by the hydrogenation of these polyunsaturated fatty acids (mainly from mass produced seed oils such as rape and sunflower) to form “useable” trans fats which are abundant in fast and convenience foods. There is little doubt that this imbalance is directly responsible for the development of chronic long term diseases which ravage western society.

Along with the fatty acids paradox oil contains the fat soluble vitamins;

1. Vitamin A
2. vitamin D
3. vitamin E

These vitamins occur naturally in fish oil and olive oil and their roles in maintaining health are well documented.

However, also contained in paradox oil are a family of compounds known as polyphenols (only found in abundance in extra virgin olive oil). New research is proving their unique and powerful antioxidant activity against oxygen derived free radicals in pathological processes. Hydroxytyrosol (one of olive oils polyphenols) has the highest level of free radical protection activity ever reported for any natural antioxidant compound measured on the ORAC scale (oxygen radical absorbance capacity)

Hydroxytyrosol	(olive oil)	37000
Oleuropein	(olive oil)	16000
Epicatechin	(green tea)	8100
Ascorbic acid	(vitamin C)	1890
Vitamin E	(vitamin E)	1350

The therapeutic value of the phenol compounds contained in extra virgin olive oil (as many as 5mg of antioxidant polyphenols in every 10 grams of olive oil) may be the key to the seemingly synergistic combination of these fatty acids. As they are fat soluble they can remain stored in the body ready for use, unlike the water soluble antioxidant flavenoids which are washed out of the body systems. Along with the fatty acids the fat soluble polyphenols have been shown to have a wide range of beneficial effects in pathological processes where oxidative stresses are paramount. Many other nut and seed oils contain few if any polyphenols and thus may not show the same therapeutic range as the blend of oils in Paradox

### **Conclusion:**

With regard to the musculoskeletal system there was a significant improvement in all of the clinical parameters in a majority of the patients. A number of patients on this small pilot study also reported and were seen to have beneficial effects in other body systems. Results of this preliminary study suggest that a blend of fish oil with extra virgin olive oil can be beneficial to patients with inflammatory and degenerative joint disease and may have positive effects on other body systems.

### **NB.**

***The above Pilot study predates our current formulation in which the vitamin A has been removed at source from the fish oil. This was due to public awareness around possible vitamin A toxicity particularity in pregnancy  
GH (sept. 2007)***

### **SELECTED REFERENCES:**

1. Marine oils; the health benefits of n-3 fatty acids. Nutrition reviews vol.54 Nov. 1996
2. Omega 3 essential fatty acids. American journal of Health-System Pharmacy vol. 56 Apr. 1999
3. Supplementation of fish oil and olive oil in patients with rheumatoid arthritis. Nutrition Feb. 2005
4. Ratio of omega-6 to omega-3 fatty acids. Gabe Mirkin ,M.D.
5. Valavanidis et al. Olive oils role in the Mediterranean diet. Journal of Agriculture and Food Chemistry Apr. 2004
6. Free radical scavenging actions of olive oil phenolics  
Viscoli, Galli; Lipids vol.34 1999

7. Olive oil and Breast cancer ,Trichopoulou ; Cancer Causes Control Nov. 1995
8. Antiatherogenic components of olive oil Viscoli , Galli; Curr Atheroscier Rep Jan. 2001.
9. Omega 3 Fatty acids in health and disease and in growth and development. Simopoulos ; Am. Journal of Clinical Nutrition.
10. Fatty Acid Metabolism, Micheal W King I.U. School of Medicine iupui.edu Aug. 2005.