



**THE LAWSON NUTRITION AND HEALTH SCIENCE
RENOURISH FUNCTIONAL FOOD FORMULA™**

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with endorsements by Dr. Leanne Barron and Professor Cliff Hawkins.
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Lawson Nutrition and Health Science™ is an initiative of Red House Residential and Day Clinic Limited

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LAWSON NUTRITON AND HEALTH SCIENCE™

PART ONE

RENOURISH FUNCTIONAL FOOD FORMULA™

INTRODUCTION

RED HOUSE Residential and Day Clinic Limited (RED HOUSE) is a not-for-profit organisation and all business conducted under its umbrella is not-for-profit. RED HOUSE is an acronym for Recovery from Eating Disorders: Hope Optimism, Understanding, Support, and Empowerment. Lawson Nutrition and Health Science™ is a trade name owned by RED HOUSE and was established for the purpose of developing science-based nutritional products as one of the treatments that RED HOUSE offers.

RED HOUSE was established in response to the poor outcomes derived from current treatment practices for eating disorders (ED), particularly Anorexia Nervosa (AN). In Australia, the mortality rate for people with Anorexia is the highest of all psychiatric disorders and up to 12 times higher than that of the general population, with a significant proportion (up to 20%) of deaths attributed to suicide (NEDC 2015, p. 5). Anorexia has a less than 50% remission rate and a reported poorer quality-of-life than both the general population and those with other mental health conditions (Winkler et al. 2017).

RED HOUSE aims to provide sufferers with new and innovative options to improve treatment efficacy. While the long-term plan is to establish a residential facility for multidisciplinary treatment, the short term (current) focus is on provision of specific nutritional solutions. As



such RED HOUSE has established the brand Lawson Nutrition and Health Science™. In addition to its founder, Mary Lawson (B Health Sc.), the Lawson Nutrition and Health Science™ team comprises Dr. Leanne Barron, a GP who specialises in nutritional medicine, Casey Dick, a clinical nutritionist, and Professor Cliff Hawkins, a Biochemist.

While the nutritional products offered are primarily designed for the treatment of people with anorexia they are equally applicable in treating other cohorts of people with issues resulting in malnutrition; for example, other eating disorders, the elderly, cancer sufferers and those with Cystic Fibrosis. This paper will focus on people suffering from Anorexia (and other eating disorders).

Currently Lawson Nutrition and Health Science™ has developed two concepts: –

1. the ReNourish Functional Food Formula™ (a weight restoration supplement), and
2. the Nourish MEals™ (a nutritional rehabilitation program)

Both of these components have been scientifically developed to include a variety of premium quality nutrient-rich ingredients with medicinal qualities known to be pertinent to those with anorexia. While the ReNourish Formula™ is designed to be used in conjunction with the Nourish MEals™ (since in tandem the two will result in optimal outcomes) both can stand alone as highly nutritious and beneficial components of any diet.

RED HOUSE has planned a staged roll-out of a number of services and is currently seeking funding to manufacture, market and undertake a trial of part one: the ReNourish Functional Food Formula™. As such this proposal focusses on that aspect. Upon success of the part one trial, funding for the introduction of part two: the Nourish MEals™, will be sought. A comprehensive report on the full nutritional rehabilitation program - incorporating both components - is available upon request.



While designed primarily for people suffering from Anorexia Nervosa, both the ReNourish Functional Food Formula™ and the Nourish MEals™ have a wider application to those suffering from other eating disorders, including Bulimia Nervosa (BN), Binge Eating Disorder (BED) and EDNOS, as well as other people who have difficulties maintaining adequate nutritional status for various reasons. Since these cohorts also commonly experience malnutrition, albeit in a less obvious way to those with anorexia, much of the information and evidence presented in this paper is applicable to them too.

THE RENOURISH FUNCTIONAL FOOD FORMULA™

Lawson Nutrition and Health Science™ was established as a trade name, owned by RED HOUSE, for the purpose of creating and delivering science-based nutritional products to people suffering malnutrition. Our launch product - the ReNourish Functional Food Formula™ - is a nutritionally-dense drink comprised of all-natural functional food ingredients. It is available in 2 versions – the standard formula and a vegan & allergy formula.

The **standard formula** comprises 4 parts, the first 3 of which are to be mixed together in water (as per directions included in the pack) and blended:

1. A plant-food powder (high in protein, vitamins, minerals & enzymes)
2. A cold-pressed oil blend rich in essential fatty acids
3. Potentiated Bee Pollen
4. 2 capsules containing whole food ingredients (no synthetics) rich in essential nutrients

The 2 capsules are to be taken with the drink, as per directions included in the pack.

The **vegan & allergy formula** comprises 3 parts. All bee, fish and other animal products have been omitted. The first 2 products are to be mixed together in water (as per directions included in the pack) and blended:



1. A plant-food powder (high in protein, vitamins, minerals & enzymes)
2. A cold-pressed oil blend rich in essential fatty acids
4. 2 capsules containing whole food ingredients (no synthetics) rich in essential nutrients

(See attachment 1, p. 52, for ingredient lists and functional analysis).

The unique combination of the functional ingredients included in these formulas epitomises Hippocrates principle of utilising food as medicine. It has a sound scientific basis and is proposed as a legitimate and primary form of medicine for anorexia (and other conditions where malnutrition is prevalent). The ReNourish Functional Food Formula™ is (arguably) the pinnacle treatment for those suffering anorexia - a disease characterised by malnutrition. Each ingredient has been selected for its ability to target a specific nutritional deficiency or deficiencies known to be common in people suffering with anorexia. This was based, amongst other evidence, upon scientific data drawn from Barron et al. (2017) and the extensive research and experience of [Dr James Greenblatt](#), MD.

In reference to Barron et al. (2017) the authors' intent was to identify common biochemical and haematological abnormalities, the information of which "could be useful in the ongoing treatment of EDs and provide guidance for nutritional programs". Lawson Nutrition and Health Science™ was established in response to this.

This initiative has also drawn from the work of Ancel Keys, particularly the renowned 1944 Minnesota Starvation Experiment - a gruelling study of the physical and psychologic effects of semistarvation and the problems associated with refeeding civilians who had been starved during the war. One of the legacies of the experiment was a greater understanding that starvation has a dramatic impact on personality, and that nutrition (or lack thereof) directly impacts mind as well as body. This has significant implications for the treatment of anorexia and suggests that personality and mental disturbances are largely a result of starvation and



malnutrition, as opposed to the anorexia (starvation) being a consequence of a mental disorder (nervosa) as it is typically viewed. Thus, the Lawson Nutrition and Health Science™ initiative centres around anorexia being primarily a disease of malnutrition resulting in psychological symptomology, not the other way around. The ReNourish Functional Food Formula™ was developed to address this, by correcting specific nutritional deficiencies which are thought to have triggered epigenetic changes etiologically associated with anorexia.

The name ReNourish indicates that it is designed for those who are malnourished and probably (though not necessarily) in need of significant weight restoration. Functional foods are those foods known to contain particularly high levels of nutrients which play a functional role in promoting and/or enhancing human health (see attachment 1). By consuming the nutrient-rich whole-food derived ingredients in the ReNourish Formula™ the need for synthetic vitamin and mineral supplementation is greatly reduced, and may even be eliminated for some sufferers. It is hypothesised that it can also reduce or eliminate the need for pharmaceutical drugs in some cases. This should be assessed on an individual basis according to regular biochemical analysis (as recommended by Barron et al. 2017) and other medical and psychological indicators.

The ReNourish Formula™ is suitable for use in hospitals, the residential care setting, or in the home. It is designed for use by anyone suffering from malnutrition or an inability to maintain adequate nutrition, regardless of their age, weight, or living situation. It is ideal for those living in rural and remote areas who are often neglected in terms of treatment accessibility and options relating to health care.

RE-FEEDING CONSIDERATIONS FOR ANOREXIA

Following their comprehensive systematic review concerning caloric and nutritional requirements for re-feeding in anorexia, Merzola et al. concluded that:



There is limited empirical data available that define optimum food choices for weight restoration and address the challenges associated with rate of weight gain and weight maintenance. This has hampered the development of evidence-based guidelines for nutritional rehabilitation therapy in AN (p.291).

Their review sought “to draw attention to the need for the development of a foundation of basic nutritional knowledge about AN so that future treatment can be evidenced-based”. Through the development and trial of the Lawson Nutrition and Health Science™ products (i.e. the ReNourish Formula™ in conjunction with the Nourish MEals™) RED HOUSE aims to provide comprehensive and objective evidence regarding the benefits of specific whole food sources of nutrition in the treatment of anorexia.

One vital consideration when commencing re-feeding, particularly of patients who are chronically starved and/or severely underweight, is refeeding syndrome. Though relatively rare, this adverse response to rapid and acute refeeding can be fatal. This syndrome is biochemically characterized by hypophosphatemia, hypomagnesemia, hypokalemia, glucose intolerance, fluid overload, and thiamine deficiency. Clinical consequences can be cardiac arrhythmias, congestive heart failure, hypotension, respiratory failure, rhabdomyolysis, coma, seizures, skeletal-muscle weakness, encephalopathy, metabolic acidosis, and ataxia (Marzola et al. 2013). “People at the highest risk are those with a BMI less than 12 kg/m², those who vomit, abuse laxatives and binge, and those with concurrent physical conditions” (Nice 2004, 6.4.9. Other physical interventions). Those with little to no food and/or fluid intake during the last 10 days are also considered high risk. Under these conditions restoration of nutrition must be done slowly and under medical supervision in order to avoid refeeding syndrome. Medical professionals in Australia and the USA tend to utilise tube-feeding quite vehemently; often erroneously in the treatment of anorexia. The NICE (2004, 6.4.9. Other physical interventions) advises that it is less frequently implemented in the UK as they insist that oral re-feeding is far preferable. RED HOUSE fervently upholds that nasogastric feeding should be considered sub-



standard and used only as a last resort, for several reasons which have been detailed in the main document (available upon request). Objective reasoning includes the very poor quality of ingredients used in enteral Formulas. A trial of the ReNourish Formula™ is proposed as a far more advanced, scientifically sound, nourishing, and ethical option. As Merzola (2017) highlights:

Current practices of refeeding in AN are highly subjective and have limited backing in scientific research. In fact, our observations indicate that recommendations made by ED programs vary highly, and are dependent on the providers' personal experience, Resource Pluss, and biases, rather than research and evidence. Our review serves not only as a synthesis of the current, though limited, research findings, but also to call for an urgent effort to improve treatment by stimulating such research.

The ReNourish Functional Food Formula™ is recommended as the first line of treatment as soon as the patient is willing to take oral nutrition, even if only in small amounts to begin with. For many reasons - including its low glycaemic index (GI), its easily digestible proteins, and the bioavailability of vitamins, minerals and enzymes - it is a superior choice to oral supplements such as Fortisip, Ensure Plus or Resource Plus as a primary medicine for those who are at risk of refeeding syndrome. In those who are medically unstable it is important that it be sipped slowly. If a doctor does choose to impose enteral re-feeding the ReNourish Formula™ should be introduced immediately upon medical stabilisation.

The ReNourish Formula™ is designed for both concentrated, high-quality nutritional rehabilitation and weight gain. It is to be used as a supplement until weight has been restored to a healthy BMI and adequate solid food intake is being achieved. Considering the poor-quality ingredients, it can be argued that those (aforementioned) highly processed liquid supplement products currently used as a part of oral refeeding should be proscribed altogether. RED HOUSE is urging doctors and other health care professionals who are treating anorexia and other conditions resulting in malnutrition, to replace the likes of Fortisip, Ensure Plus, Resource Plus and Nutrison with the ReNourish Functional Food Formula™, at least for a trial period. It



is hypothesised that this would engender more positive outcomes than what is currently being achieved.

Marzola et al. (2013) point out that while “a fair amount is known about overall caloric requirements for weight restoration and maintenance for AN... little is known about the effects of nutritional deficits on weight gain, or how to meet nutrient requirements for restoration of nutritional status” (p. 290). It is generally assumed that people who are underweight require significantly more calories than the average population in order to gain weight. Hence, nutritional rehabilitation programs for anorexia typically place a strong emphasis on counting calories and the promotion of high fat, high sugar food-stuffs for inducement of weight gain. While this may seem logical, RED HOUSE challenges this old-school approach on the premise that it not only re-enforces an already encumbering pre-occupation with calories, but also neglects the critical issue at hand – i.e. the need for proper nourishment as opposed to just weight gain. Typical programs tend to operate on the assumption that those with anorexia require copious calories in order to restore weight. However, based on local evidence, RED HOUSE hypothesises that the use of nutrient-rich whole food (as opposed to high calorie but low nutrient food-stuffs) can actually reduce that calorie requirement. The emphasis needs to shift from a calorie-dense diet to a nutrient-dense diet. It is proposed that if the malnourished body receives concentrated amounts of the specific nutrients it is lacking, in bioavailable whole-food form, then a return to weight equilibrium will occur naturally and more easily, with less stress on the body and less need for semantics such as calorie counting. Moreover, the process of weight restoration is extremely threatening and overwhelming to people with anorexia, and non-compliance with refeeding regimes is high. It is further surmised that a focus on providing nourishment for restoration of health, as opposed to enforcing calorie consumption to induce weight gain, would elicit a far more positive emotional and behavioural response from patients, and thus, the acceptance of treatment, compliance, and likelihood of sustainable outcomes would be improved. It is projected that the Lawson Nutrition and Health Sciece™ initiative will demonstrate all of these tenets.



The anorexic condition has been shown not only to result in conditions related to acute malnutrition, but in susceptibility to diseases associated with ageing, including osteoporosis, sarcopenia, liver dysfunction, renal failure, heart disease and failure, and Alzheimer’s disease (Greenblatt 2010). While Fortisip, Ensure Plus and Resource Plus may meet some standard criteria and definition of “complete nutrition”, there has clearly been oversight with respect to the specific constituents. These products deliver carbohydrates and fats through concentrated amounts of refined sugar and refined vegetable oils, and contain denatured proteins, each of which are known to contribute to and exacerbate the above conditions (Corliss 2017, Kummerow 2014, Basciano et al. 2005).

In terms of crude nutrition, the ReNourish Formula™ is equally, if not more complete than those products currently used. The difference lies in the **quality** of macronutrient (carbohydrate, fat and protein) sources, as well as the authenticity and bio-availability of the micronutrients (vitamins, minerals and enzymes). Moreover, RED HOUSE argues that the ratio of Omega 6 and 9 to Omega 3 fatty acids renders the aforementioned products incomplete.

As Greenblatt (2010) emphasises, there needs to be a shift away from processed foods that are high in refined sugar, and/or saturated, hydrogenated and trans fats, and low in fibre, complex carbohydrates and plant-based foods, towards “nutrient-dense whole foods which provide the necessary synthesis of appropriate levels of neurotransmitters (such as dopamine and serotonin)” (p. 78). This is the whole premise upon which the Whole HealthCare™ program was built. The ReNourish Formula™ not only provides enough calories to induce weight-gain in those who are underweight, but more importantly, it is packed with nutrient-dense, ingredients derived from whole foods.



MACRO- & MICRO-NUTRITIONAL ANALYSIS AND COMPARISON: FORTISIP, ENSURE PLUS, RESOURCE PLUS & NUTRISON vs. THE RENOURISH FUNCTIONAL FOOD FORMULA™

Carbohydrates

One of the known attributes of re-feeding syndrome is Hypophosphatemia – an electrolyte disturbance in which there is a dangerous drop in the level of phosphate in the blood. This can cause cardiac and respiratory failure, delirium and fits. Ingestion of concentrated carbohydrates during refeeding may result in a precipitate drop in serum phosphate levels. (NICE 2004, 6.4.9. Other physical interventions; Marzola et al. 2013).

Together, Maltodextrin and sugar constitute the bulk of Fortisip, Ensure Plus and Resource Plus - making them extremely high in refined carbohydrates. Thus, while touted as “medicinal” products, they have significant potential to cause many health concerns, including the inducement of re-feeding syndrome. For this reason, they should be considered a relative contraindication and disregarded for refeeding in anorexia, especially those at risk of re-feeding syndrome.

Maltodextrin is a primary listed ingredient in Fortisip, Ensure Plus, Resource Plus and Nutrison. Maltodextrin is essentially a sugar and its undesirable role in these products is as a sweetener, thickener and preservative. It serves no essential nutritive purpose as it contains no fibre, vitamins, minerals or enzymes, and while contributing to the carbohydrate contents of these supplements, it does so in potentially harmful form. It is an artificially produced white powder that can be enzymatically derived from any starch, most commonly made from corn, potato starch or wheat. Like other forms of refined sugar, maltodextrin is known to cause rapid spikes in blood sugar levels (BSL), and to inhibit the production of good bacteria in the gut. It can also trigger allergies and inflammation in some people. All of these factors are highly relevant and antagonistic to the treatment of anorexia (Greenblatt 2010 pp. 76-78).



It appears that the health risks associated with consumption of refined sugar are completely disregarded when it comes to re-feeding people with anorexia. Considering the highly refined diets - including refined sugar - commonly fed to patients undergoing re-feeding treatment, one could assume that the only concern is for weight-gain rather than overall health.

Pure refined sugar is another prime ingredient in Fortisip, Ensure Plus and Resource Plus. All three products specify sucrose/sugar as their second most highly concentrated ingredient (following maltodextrin and excluding water). In fact, Nestle Resource Plus specifies that over half (58%) of their product is sugar. Given Ensure Plus is produced in the USA, it is likely that this “sugar” is in the form of fructose, though this is only a speculation. While details regarding the effects of specific forms of sugar is beyond scope of this paper, suffice to say that some have a more detrimental effect on health than others, and refined fructose is well recognised as one of the most harmful (Basciano et al. 2005).

Refined sugar by any name (of which there are over 50) is known to cause and/or contribute to a host of health concerns, including chronic inflammation, cardiovascular disease, fatty liver disease, neurological disorder, diabetes and certain cancers (Knüppel et al. 2017, Corliss 2014, Dunne 2002) – diseases which although are commonly associated with overweight, are also a threat to those who are severely underweight (Greenblatt 2010 pp. 77-78). Due to a low body mass index (BMI), people with anorexia generally have a lower threshold for substances which have a potentially toxic effect on the body, including sugar. According to Aragno and Mastrocola (2017) “the rapid increase in metabolic diseases, which occurred in the last three decades in both industrialized and developing countries, has been related to the rise in sugar-added foods and sweetened beverages consumption. An emerging topic in the pathogenesis of metabolic diseases related to modern nutrition is the role of Advanced Glycation Endproducts (AGEs)”. AGEs can be ingested through the consumption of foods which have been cooked or processed at high temperatures, but can also be endogenously formed as a



consequence of a high dietary sugar intake. This occurs through glycation - the non-enzymatic reaction of glucose, alpha-oxoaldehydes, and other saccharide derivatives with proteins, nucleotides, and lipids. Early glycation adducts (fructosamines) and advanced glycation adducts (AGEs) are formed. This is a complex topic, the intricacies of which are well beyond the scope of this paper, however, Aragno and Mastrocola (2017) summarise the detrimental effects that products that are high in refined sugar can wreak on the body. This supports the assertion that products such as Fortisip, Ensure Plus and Resource Plus - due to their high sugar content - pose more of a threat to the health of patients attempting to recover from anorexia:

The *in vitro* observation that fructose is one of the most rapid and effective glycating agents when compared to other sugars has prompted the investigation of the *in vivo* fructose-induced glycation. In particular, the widespread employment of fructose as sweetener has been ascribed by many experimental and observational studies for the enhancement of lipogenesis and intracellular lipid deposition. Indeed, diet-derived AGEs have been demonstrated to interfere with many cell functions such as lipid synthesis, inflammation, antioxidant defences, and mitochondrial metabolism. Moreover, emerging evidence also in humans suggest that this impact of dietary AGEs on different signalling pathways can contribute to the onset of organ damage in liver, skeletal and cardiac muscle, and the brain, affecting not only metabolic control, but global health. Indeed, the most recent reports on the effects of high sugar consumption and diet-derived AGEs on human health reviewed here suggest the need to limit the dietary sources of AGEs, including added sugars, to prevent the development of metabolic diseases and related comorbidities (p. 385).

Furthermore, a high sugar diet categorically causes dental caries (Price 1932). This is of huge significance to people with anorexia (and other ED), since malnutrition and dehydration both have negative effects on oral health, and on top of this many sufferers engage in binge-purge behaviours which have significant corrosive effects. The consumption of highly acidic diet soft-drinks is also common and compounds the damage. Thus, the very high sugar content of Fortisip, Ensure Plus and Resource Plus, each of which are designed to be ingested orally, can further exacerbate the high rate of tooth decay in people with eating disorders. Poor oral health is also a serious problem amongst people with eating disorders, and is often ignored within treatment programs as it is brushed aside as a relatively minor, secondary problem. On



the contrary, poor oral health can have a devastating impact on numerous other aspects of both physical and mental health (ibid.). Unlike most programs, the Lawson Nutrition and Health Science™ initiative encompasses vital care surrounding oral health.

Fortisip, Ensure Plus and Resource Plus are promoted by their manufacturers as medical-grade nutrition specifically and scientifically designed for malnourished patients. RED HOUSE seriously questions the validity of these claims, since maltodextrin and refined sugar have been used as a very cheap way of achieving calories, volume and taste at the expense of providing actual nutrition. While carbohydrates are certainly essential in any diet, these products provide them in a nutrition-void form. They provide nothing besides “empty calories” and the potency of such high GI carbohydrates can be detrimental. It is proposed that by replacing these products with the ReNourish Formula™ (as per the recipe and under medical supervision) incidences of refeeding syndrome could be reduced. Moreover, as will be discussed later the refined oils along with the array of synthetic vitamins and minerals contained in these drinks constitute poor science when it comes to providing high-quality bio-available nutrition. Thus, their use in the practice of medicine should be seriously re-evaluated.

Having condemned refined sugar, it is important to acknowledge that glucose is essential to homeostasis, and glucose is obtained and synthesised via the ingestion of carbohydrates, including various forms of sugar. Glucose is the body’s first and primary source of energy and it is critical to many other processes surrounding maintenance of health. naturally occurring sugars found in whole foods - like fruit, vegetables and unrefined grains - play an important role in the body. The ReNourish formula provides complex carbohydrates in the forms of whole grains (quinoa, amaranth, millet) and nutrient-dense fruits, including kiwi, banana and dates.

Dates are mineral rich, providing a great source of manganese, potassium, magnesium, phosphorus, zinc, calcium, iron and Vitamin B6. They also contain significant B Vitamins and natural fibre for gut and bowel support (Juhaimi 2012, Vayalil 2012). These nutrients, along



with the natural fibre in whole dates lower the Glycemic Index (GI) and support the gut's own resistance to permeability. While people with anorexia are more likely to suffer hypo-glycemic episodes than to become hyper-glycemic, delivering regular doses of lower GI carbohydrate – as provided in both the ReNourish Formula™ and the Nourish MEals™ - will prevent both spikes and drops in blood-glucose levels. Frequent and concentrated doses of high GI carbohydrate (as delivered in Fortisip, Ensure Plus and Resource Plus as well as most of the foods served in typical eating disorder programs) increases the risk of hyper-glycemia, neurotoxicity, insulin resistance, diabetes, cardiovascular disease, blood-lipid abnormalities, and tumours (Dunne 2002, p. 6). Dates are easily digested and help metabolize proteins, fats and carbohydrates. Research suggests that there are numerous health benefits of dates, and they serve as a potential medicinal food for humans with global applicability (Vayalil 2012). They are a great natural sweetener and can be used to bind ingredients together in a similar, though far healthier manner to maltodextrin.

In summary, there is significant evidence to support the notion that the refined sugar which is used as an essentially nutrient-void source of carbohydrate in Fortisip, Ensure Plus and Resource Plus poses a multifaceted health risk to those recovering from anorexia. In stark contrast, the ReNourish Functional Food Formula™ delivers complex carbohydrates through nutrient-rich low GI whole grains and fruits.

Fats

Fats, (lipids) are one of the most elemental nutrients for humans and lipid metabolism generates many bioactive lipid molecules which are fundamental mediators of multiple signaling pathways. They are also indispensable compounds of cell membranes (Oravova 2015). When it comes to human health, it is not the amount of fat that is consumed, but the **type** of fat that really matters. Some fat types are required by the body and brain in abundance, while others are best avoided (Lauretti & Praticò 2017; Orsavova et al. 2015; Patterson et al.



2012; Simopoulos 2006). Due to the typical avoidance of all dietary fat, people with anorexia are almost invariably deficient in the essential fatty acids that are critical to brain health and overall bodily function (Marzola et al. 2013; Holman et al. 1995). Thus, throughout the re-feeding process special attention should be paid to ensuring **quality** sources of these fat are provided.

The fat content of Fortisip, Ensure Plus, Resource Plus and Nutrison comprises a mixture of various vegetable oils. Fortisip specifies the use of canola and corn and Ensure Plus specifies canola and sunflower. Resource Plus consists of vegetable oils in the form of sunflower and rapeseed (another name for canola), while Nutrison simply generalises with “vegetable oils” (see attachment 2). When food products contain high quality oils which are beneficial to health they are almost invariably labelled with the term “extra-virgin”, “virgin” and/or “cold-pressed” to indicate that they are undamaged and have been protected from oxidation during the extraction process, and this is usually in reference to olive oil, nut oils, and some seed oils. “Vegetable oils” on the other hand, is a generic term usually used on labels to disguise the fact that cheap, poor quality denatured oils have been used. It is a term associated with highly processed canola, corn, sunflower, safflower and/or soybean oils - all of which are high in volatile omega-6 polyunsaturated fatty acids, known as PUFAs.

PUFAs oxidise very rapidly when exposed to heat or air, turning oils rancid (Dunne 2002, p. 8). While they have significant health-promoting properties in their raw, unaltered state (e.g. raw nuts and seeds and “virgin” or “cold-pressed” oils) unfortunately the chemical and heat-treated methods in which those particular “vegetable oils” are extracted from their natural origin results in a product that no longer contains beneficial fatty acids, but instead harmful oxidized lipids, free radicals, trans-fatty acids (TFAs), aldehydes, and other toxic elements (Stein 2015, Grootveld 2014). Due to their low cost and their ability to extend shelf-life of a product these oils are very appealing to commercial food manufacturers, and thus they have become the most widely used oils on the planet (Lauretti & Praticò 2017). There is mounting evidence



to suggest that these poor-quality vegetable oils contribute to a number of serious health concerns including, cancer, inflammation, mitochondrial damage, synaptic injury, and impairment of working memory (NIH 2018, Orsavov et al. 2015, Simopoulos 2006, Dunne 2002, pp. 8 & 63). Orsavov et al. (2015) suggest that due to the “potential risk of lipid peroxidation, the consumption of these oils should be rather in minor amounts and less frequent”.

In addition to the toxic substances contained in these oils, it is the high ratio of omega-6 compared to omega-3 fatty acids which also poses a threat to human health. While omega-6 in its raw state is considered a healthy and essential fat, if consumed in too high a proportion it effectively takes over the space required for omega-3 fats, and knocks them out (Stein 2015, Patterson et al. 2012).

As Simopoulos (2006) highlights:

A high omega-6/omega-3 ratio, as is found in today's Western diets, promotes the pathogenesis of many diseases, including cardiovascular disease, cancer, osteoporosis, and inflammatory and autoimmune diseases, whereas increased levels of omega-3 polyunsaturated fatty acids (PUFA) (a lower omega-6/omega-3 ratio), exert suppressive effects.

Omega-3 fatty acids are essential for normal metabolism and critical to almost every other function in the body and brain. They also play a crucial role in preventing various diseases (Orsavova 2015). EPA is as an important link in the chain of fatty acids that ultimately results in prostaglandins - localized tissue hormones - while DHA is very important for the proper function of the brain and nervous system (Fallon and Enig 2009, Rao et al. 2008). Conklin et al. 2007 found that high polyunsaturated omega-6 to omega-3 fatty acid ratios (AA:EPA and AA:DHA) are directly correlated with depressive symptoms and neuroticism. Arachidonic Acid (AA) is a conditionally-essential fatty acid as it is synthesised from linoleic acid. Canola contains a relatively high percentage of linoleic acid which, although necessary, is shown to be detrimental unless balanced out with an equivalent ratio of omega-3s. As the human body is



unable to synthesise omega-3 fatty acids they must be derived through dietary sources (Stein 2015). Greenblatt (2010) even suggests that Omega-3 deficiency is linked to an increased risk of suicide (p. 166). Fortisip, Ensure Plus, Resource Plus, and Nutrison all contain extremely high concentrations of omega-6, with very small amounts of (oxidized) omega-3 fatty acids. On the contrary, the ReNourish Formula™ has carefully considered the importance of this critical Omega 3:6:9 balance.

Further to the need for more emphasis on Omega-3 fats, Kailannan et al. (2015) implicate high levels of Omega-6 fatty acids in the development of metabolic endotoxemia, while conversion to Omega-3 fatty acids reversed the condition. Metabolic endotoxemia is commonly derived from gut dysbiosis, and is a primary cause of chronic low-grade inflammation that underlies many chronic diseases. Kaliannan et al. (2015) concluded that “given the excess of omega-6 and deficiency of omega-3 in the modern Western diet, the differential effects of tissue omega-6 and omega-3 fatty acids on gut microbiota and metabolic endotoxemia provide insight into the aetiology and management of today's health epidemics” (p. 1).

In their assessment of the essential fatty acid status of patients with anorexia nervosa Holman et al. (1995) found that subjects with anorexia nervosa showed polyunsaturated fatty acid deficiencies in plasma phospholipids that were different from simple nutritional essential fatty acid deficiency or chronic malnutrition. This suggests that patients with anorexia have very unique needs, especially when it comes to restoration of fat. It was concluded that patients with anorexia nervosa demonstrate deficiencies in essential fatty acids, with compensatory changes in non-essential fatty acids and decreased fluidity of plasma lipids. Thus, the consumption of monounsaturated fats seems not to be as critical as other fats during the process of refeeding in the treatment of anorexia, since these non-essential fatty acids are being readily bio-synthesized. Canola oil - the primary fat source used in those commonly used refeeding formulas - is very high in monounsaturated fat. This makes it a poor choice because in addition to being a low-quality damaged substance the opportunity to include a higher



concentration of premium-quality **essential** fatty acids – such as virgin polyunsaturated omega-6s and especially omega-3s - has been forfeited.

The fault in using cheap canola in these supplements certainly doesn't end there. Due to its high monounsaturated fat content, canola oil is often promoted as being a less expensive equivalent to virgin olive oil – the latter well recognized as one of the world's healthiest dietary oils. However, unlike olives and their oils, canola is a genetically engineered industrial commodity, derivative of the rapeseed crop, and is exposed to high heat and toxic chemicals during the oil extraction process. Consequently, canola oil has been found to be associated with increased formation of amyloid-beta 1-42 plaques and phosphorylated tau, responsible for the formation of tau neurofibrillary tangles, which cause neuronal dysfunction, degeneration and memory loss in Alzheimer's disease (Lauretti & Praticò 2017). Conversely, extra-virgin olive oil has been proven to attenuate amyloid-beta plaques and tau pathologies (Hisham et al. 2015).

Having focussed on Canola oil as the primary fat source used in these manufactured liquid supplements, suffice to say that corn, sunflower and soybean oils are just as poor in quality, and pose just as much risk to health. Processed in a similar manner to canola, any potential health benefits of these oils in the raw state have been destroyed, transforming them instead to a product which is often rancid, and contains toxic elements. As stated by Professor John Stein (2015) - Oxford University's emeritus professor of neuroscience - due to the likes of corn and sunflower oils "the human brain is changing in a way that is as serious as climate change threatens to be." It is reasonable to assume that they have been used as ingredients in these products more for their cost-saving merits than their health-promoting properties, since the use of cold-pressed seed and nut oils, as used in the ReNourish Formula™ would have been a far more health-promoting (albeit less profitable) choice.



Other evidence indicates that “vegetable oils” such as those listed in Fortisip, Ensure Plus, Resource Plus and Nutrison, may inhibit brain derived neurotrophic factor (BDNF) production (Patterson et al. 2012, Simopoulos 2006). BDNF is a gene which:

includes nerve growth factor (NGF), neurotrophin 3 (NT3) and neurotrophin 4 (NT4). BDNF is a one of the most widely distributed and extensively studied neurotrophins in the mammalian brain, with multipotent impact on brain signaling and synaptic plasticity. Among its prominent functions, one can mention control of neuronal and glial development, neuroprotection, and modulation of both short- and long-lasting synaptic interactions, which are critical for cognition and memory (Kowiański et al. 2018, p. 579.)

According to Knüppel et al. (2017) refined sugar also depletes BDNF, “facilitating neurogenesis and hippocampal atrophy in depression”. Due to their state of malnutrition those suffering anorexia are already highly susceptible to all of the abovementioned health concerns and degenerative processes. Thus, anything that exacerbates them, such as processed and damaged oils, should be conscientiously eliminated during treatment. Moreover, those fats which are protective against such ailments - i.e. undenatured essential fatty acids, particularly EPA and DHA - should be supplied in ample proportions.

To summarise the importance of such fats, Orsavova (2015) state that:

Recently, essential fatty acids (EFAs) have been considered as functional food and nutraceuticals. A lot of research studies have documented their significant roles in many biochemical pathways resulting in cardioprotective effect because of their considerable antiatherogenic, antithrombotic, anti-inflammatory, antiarrhythmic, hypolipidemic effect, because of the potential of reducing the risk of serious diseases, especially cardiovascular diseases, cancer, osteoporosis, diabetes and other health promotion activities following from their complex influence on concentrations of lipoproteins, fluidity of biological membranes, function of membraned enzymes and receptors, modulation of eicosanoids production, blood pressure regulation, and finally, on the metabolism of minerals. EPA and DHA have also been associated with the protection against mental disorders like Alzheimer’s disease, aging and dementia.



To this end, and in stark contrast to the fat sources contained in Fortisip, Ensure Plus, Resource Plus and Nutrison, the ReNourish Formula™ comprises **only** premium quality fat sources - including EPA and DHA, beneficial medium chain triglycerides (MCTs) from the coconut milk, and a combination of 6 cold-pressed seed and nut oils (see attachment 1). Together these oils are very high in **virgin** (undamaged) PUFAs and essential omega-3 fatty acids - including linolenic acid, linoleic acid, EPA and DHA. When extracted in their virgin state, all of these are known to be crucial for overall body and brain health (Orsavova et al. 2015; Marzola et al. 2013, Simopoulos 2006). Furthermore, attention has been paid to ensuring an appropriate ratio of fat-types, taking into account those that have been found to be significantly lacking in the diets and biochemistry of those suffering anorexia-related malnutrition (see Greenblatt 2010, Marzola et al. 2013, Holman et al. 1995).

As mentioned early on, Lawson Nutrition and Health Science™ has drawn from the research work of Ancel Keys, and while some of his work has provided invaluable insight into the effects of starvation, he also produced some theories on saturated fats and cholesterol now considered to be flawed. In the early 1960s Keys' highly influential work advised that saturated fat is to blame for coronary heart disease and thus should be eliminated from the diet. However, according to (the late) [Fred Kummerow](#) (2014) – former veteran Professor of comparative biosciences at the University of Illinois - this has become a misconception as more recent evidence suggests that some saturated fats are actually beneficial and indeed essential to health. Increasingly, those volatile polyunsaturated vegetable oils (refined PUFAs) discussed above are being implicated, not only in the development of heart disease but a myriad of other ailments (Stein 2015, Orsavova et al. 2015, Grootveld 2014). While saturated fat is certainly not “off the hook” in terms of being a health hazard, it is naturally present in many foods that have been proven beneficial to the human diet. It is impossible to completely avoid saturated fat without becoming deficient in many essential nutrients, which is probably nature's way of telling us that we do need some saturated fats, albeit in relatively small amounts. The important point is to realise that not all forms of saturated fat are equal. As with



polyunsaturated fats, some forms (especially those that have been heated to high temperatures) are very problematic with respects to their impact health, while others are in fact beneficial (Kummerow 2014).

Unfortunately, coconut tends to be lumped into the same category as denatured animal fats, including highly processed forms like sausages, deli meats and many cheeses. Coconuts are indeed rich in saturated fat, however their fatty acid profile differs markedly from that of animal products. While animal fats are high in long-chain saturated fatty acids, coconuts contain primarily lauric acid - a short-chain fatty acid - and other medium-chain triglycerides (MCTs). Contrary to the disease-promoting factors identified in long-chain fatty acids, short and medium chain fatty acids have a number of disease-protective properties. In addition to anti-inflammatory factors, studies have shown positive effects on the microbiome, the adrenal system, the cardiovascular system, and the brain (Alban & Alban 2018, McCarty & DiNicolantonio 2016, Alcock & Lin 2015). McCarty and DiNicolantonio (2016) point out that South Asian and Pacific Island populations which use coconut products as their primary source of dietary fat have low rates of cardiovascular disease, heart attacks, cancer, and diabetes. Its recognized health-giving properties have resulted in those people referring to the coconut as the “tree of life” (Alban & Alban 2018). Hence, the decision to use quality coconut milk powder as the base for the ReNourish Formula™. This also ensures that those who are lactose intolerant and/or vegan are not excluded from benefiting from the formula.

The ReNourish Formula™ incorporates Green Pasture’s unique combination of cod-liver oil and high vitamin butter oil, each of which has health benefits on their own, but together provide further proven benefits. Firstly, the butter oil provides a small amount of natural saturated fat derived from the milk of pasture-raised cows. Butter – especially from grass-fed cows - is one such product that appears to have beneficial nutrients which outweigh the potential threat of its high saturated fat content when consumed in small amounts. Moreover, due to the tendency for low overall biochemical fat in people with anorexia, it is important for some high-



quality saturated fat to be included as a part of the refeeding process. Both the butter oil and the coconut milk in the ReNourish Formula™ provide this.

The high-vitamin butter oil has further benefits, including being high in coenzyme Q10 (CoQ10). CoQ10 is a fat-soluble antioxidant that works in synergy with vitamins C, E and glutathione. One of its key roles is in mitochondrial energy production, and thus it is a major contributor to the production of energy in the body (Pratt & Matthews 2004, pp. 93 & 176). Furthermore, CoQ10 is known for its ability to improve cardio bioenergetics, protect both lipids and ATPase protein from oxidation, normalise cancer cells, improve the energetics of immune cellular system, protect from infection, and strengthen the heart (Osiecki 2010, p. 29). These are all highly relevant factors to the condition of anorexia, and thus the role of CoQ10 should not be underestimated in its treatment. As with any nutrient, whole food sources are superior to isolated and/or synthetic supplementation and thus the butter oil is an ideal source as it remains in its raw and natural state and is ingested with synergistic nutrients.

Grass-fed butter oil is rich in butyric acid, which is thought to have important roles in human metabolism and stress resistance and as a systemic anti-inflammatory substance (Green Pasture Australia 2018). It is also a rare and significant source of Vitamin K2, which plays a significant role in the prevention of osteoporosis (Rees et al. 2010). As the NICE (2004) points out:

Bone loss is a serious problem in anorexia nervosa with serious long-term consequences. Oral oestrogen and oral DHEA do not appear to have a positive impact on bone density and hormone replacement therapy is not recommended in children and adolescents as it may cause premature fusion of the bones. The most effective treatment/preventative agent for osteoporosis in anorexia nervosa is not yet known. Adequate nutrition and weight are the most relevant factors (6.4. Management of physical aspects: 6.4.6. Osteoporosis, and 6.4.7. Clinical summary).

A synthetic daily dose of calcium, as is common practice by many doctors, is not an effective or appropriate treatment as it is not readily absorbed and instead can cause a build-up of



dangerous calcium deposits in the blood and aorta, especially in the absence of Vitamin K2 (Osiecki 2010, p. 67). Excess calcium can reduce the activity of magnesium (ibid. Forward, Synergistic nutrients), and magnesium is already commonly deficient in those with anorexia. Thus, adequate amounts of readily absorbed calcium and Vitamin D3 from whole food sources are required, as is delivered in the ReNourish Formula™. The presence of Vitamin K2 also enhances the uptake of Vitamin D3 and food-derived calcium - thus synergistically providing excellent protection from osteoporosis (Fallon & Eings 2009, Cockayne et al. 2006, Dunne 2002, p. 14). A systematic review of several studies by Rees et al. (2010) found a higher intake specifically of Vitamin K2 (not K1) significantly reduced the risk of coronary heart disease.

The premium-grade virgin cod-liver oil is rich in much needed naturally occurring vitamins A and D. Compared to synthetic supplementation, obtaining these two particular nutrients from a whole food source means they are readily absorbed, and the risk of accidental toxicity is greatly reduced (NICE 2004, 6.4.9. Other physical interventions). In addition to augmenting the absorption of vitamin D and calcium, the combination of the 2 oils enhances the uptake of other fat-soluble vitamins and the spectrum of minerals contained in the ReNourish Formula™.

There are further benefits still. Green Pasture's cod-liver oil/high vitamin butter oil was inspired by [Dr Weston A Price](#) - a dentist, Nutritional Medicine researcher and pioneer, and author of the 1931 book [Nutrition and Physical Degeneration: A Comparison of Primitive and Modern Diets and their Effects](#). In his research Dr Price discovered that "when a high-vitamin cod-liver oil is taken in tandem with a high-nutrient butter oil, the combination of the two furnishes the body with the full complement of fat-soluble vitamins" (Nagel 2016). Beyond the recognised contribution to general health, Dr Price was intensely interested in the role of the fat-soluble vitamins (which he referred to as "activators") in mitigating tooth decay. In his lab work he showed that these classes of fat-soluble vitamins are important to maintaining optimum blood levels of calcium and phosphorus, essential to dental health. The principal focus of Price's 1932 article "Control of dental caries and some associated degenerative processes through the



reinforcement of the diet with special activators” was to present evidence that a mixture of cod-liver oil and a special butter oil can result in a dramatic reduction in the rate of cavities (Nagel 2016, para 13).

In 2013, University of Washington’s Professor Philippe P. Hujoel published a systematic review and meta-analysis of controlled clinical trials that considered the role of vitamin D in preventing tooth decay. Drawing amongst other Resource Pluss from the historical work of Dr Weston Price, Hujoel (2013) confirmed that the administration of vitamin D alone reduced cavities by as much as 47%-54%. In combination with the butter oil, Price demonstrated that this could be increased to 90% (Nagel 2016, Synergistic effects). Considering the detrimental effects of eating disorders on dental and oral health, this combination of cod-liver oil and high vitamin butter oil is considered a critical and invaluable component of the ReNourish Formula™.

The Green Pasture cod-liver oil is also unique in its use of the traditional fermentative production method. The fermentation process extracts essential nutrients (i.e. the oils, fatty acids, vitamins, and antioxidants) from the cod livers in their natural, undamaged form. Other benefits include being able to bottle and seal the resulting fermented cod-liver oil without the addition of synthetic antioxidants and other additives; enhanced nutrient composition and fatty acid bioavailability, and the elimination of putrefactive, anaerobic, and pathogenic microorganisms. Due to the feeding habits of the wild-caught cod, Green Pasture cod-liver oil is naturally rich in polyphenols - especially catechol and catechin. These are natural antioxidants which, like fermentation, protect the oil against oxidation and rancidity. Hence Green Pasture possesses a double barrier against oxidation. Fermentation also increases quinine levels by 700-1600%. Quinones include vitamins E, K, coenzyme Q10 (CoQ10), and many other beneficial compounds. By combining the fermented cod-liver oil with the butter oil, the level of naturally-occurring CoQ10 contained in the butter oil is greatly enhanced (Green Pasture Australia 2018).



Last but not least, the cod-liver oil also balances out the proportion of omega-3 to omega-6 fatty acids in the Formula™. As previously discussed, adequate omega-3 is imperative to body and brain function and it contributes immensely to mood regulation. Also, Costantini et al. (2017) from the Department of Ecological and Biological Sciences at Tuscia University in Italy, illustrate a number of positive associations between omega-3 fatty acid consumption and a healthy gut microbiota including “the ability of omega-3 PUFAs to influence the gut–brain axis, acting through gut microbiota composition” (p.26).

Those who follow a vegan diet will obviously be averse to taking the cod-liver/butter oil blend. This is unfortunate as there are numerous benefits from this product with no equivalent vegan-friendly substitute. However, to ensure these people still obtain at least some of the benefits the cod-liver/butter oil product has been replaced with a Black seed oil capsule and a CoQ10 supplement in the allergy & vegan formula.

In conclusion, the fat sources contained in the ReNourish Formula™ are of indisputable superiority to those found in Fortisip, Ensure Plus, Resource Plus, and Nutrison; especially with respect to the unique nutritional needs of people suffering from anorexia.

Vitamins and Minerals

As with fats, the vitamin and mineral content of a particular product cannot be assessed on face value. The origin, form and quality of those vitamins and minerals, as well as the milieu in which they sit, must be considered. While natural nutrients are those obtained from whole food sources in the diet, synthetic nutrients are isolated chemicals manufactured in a laboratory or factory. There is compelling evidence to support the notion that immense health benefits are derived from “the additive and synergistic interaction between phytochemicals present in whole foods” as they target multiple signal transduction pathways (Liu 2013, p. 18). Conversely, when certain nutrients – such as vitamins, minerals, enzymes, antioxidants and



amino acids - are isolated and synthesised to mimic a particular nutrient that exists naturally in a whole food, they usually act very differently within the body when ingested. The benefits derived from some nutrients are contingent on the presence or absence of others and nature has an innate way of combining certain nutrients in whole foods in order to deliver maximal nutritional benefit (Pratt & Matthews 2004, p. 46). Thus, as Liu (2013) surmises, optimal nutrition and health requires obtaining nutrients and bioactive compounds from a wide variety of whole foods rather than synthetic dietary supplements.

The vitamin and mineral composition of Fortisip, Ensure Plus, Resource Plus and Nutrison is achieved through fortification (as the name 'Fortisip' implies) using isolated synthesised forms of various chemicals. Thus, in reality these are not vitamins and minerals, but rather, artificial chemical constructions. While the concoction presented on the labels may appear impressive, most of these so-called "nutrients" are not effectively absorbed by the body, and some may even negatively affect the re-nourishment process.

For example, Vitamin B9 - which is also known as folate - is necessary for numerous functions including mood regulation. According to Rao et al. (2008) "various researchers have noted that depressive symptoms are the most common neuropsychiatric manifestation of folate deficiency" (p. 80). Folate is particularly in demand throughout recovery from anorexia and is provided by Fortisip, Ensure Plus, Resource Plus and Nutrison only in the form of folic acid; the synthetic form of vitamin B9. While folic acid does occur naturally in food, it must be metabolised (converted) into Dihydrofolate (DHF), Tetrahydrofolate (THF), and then finally into L-methylfolate (5-MTHF) to be used in the body. Once in this form it can be transported into cells, tissues and even across the blood-brain barrier. However, many people carry a faulty gene (MTHFR) which blocks their ability to convert folic acid to be used as necessary. Folic acid has no biological activity unless converted into folates. In its natural state, Vitamin B9 is known simply as folate and unlike folic acid, it doesn't have to go through the conversion process so is readily absorbed and utilised by the body. Folic acid is not only poorly assimilated, but also



interferes with the uptake of folate obtained from food sources, and thus disrupts the entire methylation cycle. Amongst other roles, methylation is key to regulating neurotransmitters. Thus, disruption in the methylation process causes a myriad of health issues, including depression, anxiety, sleep disturbances, inflammation, fatigue and many more (Oregon State University, 2018).

While the complex fields of genetics and epigenetics and their relevance to the condition of anorexia is well beyond the scope of this paper, it would be remiss not to make reference. There is increasing research to suggest that anorexia may be first and foremost a genetic disorder, and the implications for the process of re-feeding are immense (Greenblatt 2010). The Human Genome Project elicited the field of nutrigenomics – the study of how nutritional status affects genetic expression and how our individual genetic makeup determines our individual nutritional needs. It is hypothesised that certain nutritional deficiencies trigger the expression of a specific gene implicated in the aetiology of anorexia (Yilmaz et al. 2015). Current research in nutrigenomics indicates that some individuals, due to their unique genetic patterns and expression, do not produce adequate or effective MTHFR. The genetic variations in DNA sequencing are known as single nucleotide polymorphisms (SNPs). When SNPs occur in genes, they produce variants of that gene. Single nucleotide polymorphisms in the gene that codes for MTHFR result in production of an enzyme with decreased activity, an anomaly that can have an impact on a myriad of biochemical processes. Leclerc et al. (2013) provide an in-depth explanation about certain polymorphisms in the MTFHR gene adversely affect human health. There is significant evidence to support the hypothesis that MTHFR deficiency may predispose an individual to distinct neuro-psychiatric traits which manifest as anorexia (Gales et al, 2018, Yilmaz et al. 2015).

Greenblatt (2010) specifically delves into the complex role that genetic and epigenetic factors are thought to play in the development and perpetuation of anorexia. His compelling research and successful practical experience in treating anorexia as a primarily genetic disorder has



been the underpinning of Lawson Nutrition and Health Science™ and thus, the ReNourish Formula™. Both Booij et al. (2015) and Saffrey et al. (2014) advise that more genome-wide studies of epigenetic modifications, encompassing both DNA methylation and other epigenetic marks, are required to determine establish the clinical relevance of the affected genes in AN, and, importantly, reversibility of effects observed through appropriate nutrient-specific rehabilitation. By addressing and correcting specific nutritional deficiencies and imbalances, both the Nourish MEals™ and the ReNourish Formula™ directly target DNA methylation and other epigenetic markers that are hypothesised to be implicated in anorexia. Thus, a trial of the ReNourish Formula™ could contribute significantly to such suggested research (for further insight see Greenblatt's (2010) book, 'Answers to Anorexia').

As is evident in attachment 2, the lists of synthetic vitamins and minerals contained in Fortisip, Ensure Plus, Resource Plus and Nutrison are far too long to analyse one by one. In summary however, like folic acid most of them are poorly absorbed and can impede the body's natural biochemical production and utilisation of various other nutrients. Furthermore, synthetic versions of various vitamins and minerals have a much higher propensity to result in toxicity than their naturally derived counterparts. Most nutrients work together in a synergistic manner through particular metabolic pathways and most require co-factors to be present for activation (Osiecki 2010, Dunne 2002). Correct combinations in their correct proportions are most easily and beneficially obtained from natural whole foods (Liu 2013, Pratt & Matthews 2004).

In complete contrast to Fortisip, Ensure Plus, Resource Plus, and Nutrison, the ReNourish Formula™ contains no synthetics and is rich in the entire spectrum of vitamin and minerals derived from a wide variety of natural, bio-available whole food sources. Thus, amongst many other benefits, the synergistic nature of their role remains intact (Osiecki 2010). Moreover, in addition to a focus on specific high-quality fats, the development of the ReNourish Formula™ focussed on the specific vitamins and minerals found to be most commonly deficient in people



with anorexia (see: Barron et al. 2017, Greenblatt 2010, NICE 2004, 6.4.9. Other physical interventions) as opposed to a general spectrum of diseases or the general population.

Proteins

The human body is literally made of protein – bones, muscles, arteries and veins, skin, hair, and fingernails. The heart, brain, liver, kidneys, and lungs are also built of tissue made of proteins. Proteins help carry the oxygen required to transport blood, fat and cholesterol throughout the body (Fürst, 2009). They are involved in the “regulation of neurotransmitters, formation of antibodies and the production of energy inside the cells” (Greenblatt 2010, p. 233). In the form of enzymes, proteins digest our food, synthesize essential substances, and break down waste products for elimination. These are only some of the reasons why protein is so imperative to health, and indeed to life (Kummerow 2014).

Amino acids are the basic building blocks of proteins. They are used to build structural proteins such as collagen, enzymes, clotting mechanisms, antibodies, transport molecules, muscles and hormones (e.g. insulin). However, like other nutrients, amino acids depend on the presence (or sometimes absence) of other nutrients in the body to properly perform their functions. Ongoing studies have shown that certain amino acids can help defend against diabetes, depression, osteoporosis, heart attacks, fat metabolism disorders and a compromised immune system (Amino Acid Studies 2018). They can also help slow aging processes.

The amino acid pool refers to the entire amount of available free amino acids present in the human body. When protein is consumed in the form of food, it is broken down in the gastrointestinal tract into individual amino acids and then put back together again as new protein. This is a complex biological process known as protein biosynthesis. The entire amino acid pool is transformed, or ‘exchanged’ three to four times a day. This means that the body has to be supplied with more amino acids, partly by protein biosynthesis, partly through food. There are



20 amino acids found in the genetic code, 8 of which cannot be manufactured by the body and thus must be obtained through diet (Fürst, 2009). Deficiencies in any of these can lead to serious physical and mental health problems (Greenblatt 2010). If the one or more amino acids are not available in sufficient quantities, the production of protein is weakened and the metabolism may only function in a limited way. Older people are not the only ones who this applies to. Young people can also be affected by the negative consequences of a limited supply of protein and other nutrients. Hence, it is essential that the amino acid pool remains complete and maintained in the correct combination (Weijs et al, 2014).

Protein intake is almost invariably inadequate in people with anorexia, and consequently sufferers are commonly chronically deficient. Thus, high quality protein is imperative in the re-feeding and renourishment process (Greenblatt 2010). In their comprehensive review entitled “Proteins and amino acids are fundamental to optimal nutrition support in critically ill patients” Weijs et al (2014) state that “understanding the optimal amount of protein intake during nutritional support is... fundamental to appropriate clinical care. Although the body adapts in some ways to starvation, metabolic stress in patients causes increased protein turnover and loss of lean body mass.”

It is important to understand that different protein sources are made up of different combinations of amino acids and other nutrients, and thus, just like fats, carbohydrates, and vitamins and minerals, not all protein sources are equal in terms of quality and benefit to human health (Amino Acid Studies 2018, Fürst, 2009).

Milk proteins – in the forms of both whey and casein - are the primary listed sources of protein in Fortisip, Ensure Plus, Resource Plus and Nutrison. Whey protein in particular is an incredibly popular source of protein, particularly within the fitness and weight training industry, since it is a cheap and concentrated source of protein containing a vast array of amino acids. Casein too supplies essential amino acids, carbohydrates, sodium, calcium and phosphorus. Also,



whole milk (human and bovine) contains Lactoferrin - an iron-binding glycoprotein present in epithelial secretions and in the secondary granules of neutrophils. Many studies have shown naturally-occurring lactoferrin to be a potential therapeutic target in bone disorders such as osteoporosis, as it is thought to be an important physiological regulator of bone growth (Blais et al. 2009, Naot et al. 2005, Cornish et al. 2004, Cornish 2004). There is no doubting that whole milk provides a rich source of protein and other nutrients, and can be of great benefit to health. However, all that glitters is not gold. There are a number of pitfalls to isolating milk proteins as done in the production of supplements.

Firstly, whey protein and casein protein, as popularly used as ingredients in the food and food supplement industry, have been separated from their original whole food source – cow’s milk. The manufacturing process to achieve this requires the milk to be heated to high temperatures firstly for pasteurisation and then further during the process of isolating the proteins, both times denaturing the delicate protein structures (Cadesky et al. 2017). Whey, in the context of making protein powders, is the waste product of the cheese industry, and casein is the main ingredient used to produce cheese. Prior to industrial agriculture the whey “waste” was fed to pigs to fatten them up prior to slaughter, but in more recent times the industry has figured out how to turn this delicate substance into a highly profitable powder. In a complex process, the liquid whey is separated from pasteurized milk curd that goes into making the cheese. It is then put under high pressure and forced through a membrane to separate out the proteins from the smaller molecules. This happens at least twice as micro-filtration and then ultra-filtration. It is then exposed further to ultra-high heat and pressure during the processes which dehydrate it, (transforming it to powder form) resulting in denaturation of the proteins and oxidation of the tiny particles (Fallon Morell 2017, Cadesky 2017, Qi et al. 2015).

In its raw state (e.g. in fresh milk and yogurt) liquid whey is an excellent source of glutathione. Glutathione plays numerous critical roles in maintaining health, including the modulation of cellular processes such as DNA synthesis and protecting mitochondrial function. One of its



primary roles is as an extracellular antioxidant and as such, it is known as the body's master detoxifier (Osiecki 2010, p. 196). But glutathione is delicate and, like volatile fats, is damaged when heated to high temperatures. While it is possible to extract and powder whey protein through a freeze-drying process (as opposed to heating) it is an expensive procedure and thus very few products on the market contain whey that has been processed freeze-dried. Unfortunately, milk pasteurization temperatures alone are enough to denature glutathione. While whole-food proteins are naturally denatured (i.e. broken down) into amino acids by the hydrochloric acid (HCl) in the stomach when ingested, they are not oxidised and damaged in the same way that industrially denatured proteins are. These mutated proteins can have detrimental effects on the body. For example, as Kummerow (2014) explains, denatured fats and refined powdered protein substitutes are dietary sources of oxysterols, which alter the phospholipid membranes of our arteries in ways that increase the deposition of calcium, a key hallmark of atherosclerosis.

Following his compelling argument against the use of whey protein-based supplements Bastos (2015) – an expert in nutrition and metabolism at the Center for Primary Health Care Research, Lund University, Sweden - advises that:

...while we don't know for sure (about all the adverse consequences of whey-based supplements), and since we have alternatives, I would follow the old saying: (First) do no harm!.. If you have an auto-immune disease or allergy to Beta Lacto Globulin (protein that exists in bovine milk, but nonexistent in human milk) I would stay away from whey. Whey contains not only Beta Lacto Globulin, but also Bovine Serum Albumin. Some peptides from this protein have structural homology with peptides from our own tissues, and BSA has been implicated in Multiple Sclerosis, Rheumatoid Arthritis and Type 1 Diabetes... I would follow the evolutionary template until all these issues are resolved... (pp. 2-3).

In addition to whey and casein proteins, Ensure Plus, Resource Plus and Nutrison contain high levels of soy protein isolate (SPI). Like Canola and soybean oils, this is a very cheap ingredient and thus very appealing to, and widely used by food, drink, and supplement manufacturers



worldwide. Whole soybean products (many of which are fermented), such as Tempeh, Miso, Natto, Edamame and the handcrafted whole bean tofu - all of which consumed as staples by the Japanese - are a great source of quality protein as their amino acid content is similar to meat. They are also a good source of other nutrients such as isoflavones and phytosterols which appear to have protective properties against some diseases (Pratt & Matthews 2004, pp. 164-166). However most soy products sold and consumed within Westernised countries – including protein isolate and soybean oil - are far removed from the undenatured whole-bean products consumed by the Japanese.

To create SPI soybeans are chemically engineered to isolate the protein, a process which strips out all of the other nutrients contained in the original bean. The manufacture of soy protein isolate (SPI) is a complex, high-tech procedure that takes place in chemical factories, not kitchens. The basic process begins with defatted soybean meal, which is boiled with a caustic alkaline solution to remove the fibre, then washed in an acid solution to separate out the protein. The protein curds are then dipped into yet another alkaline solution and finally spray-dried at extremely high temperatures. The resulting proteins are invariably denatured, although some of the very tough proteins, like protease inhibitors, survive the rough processing treatment. Protease inhibitors inhibit protein digestion, which in turn may inhibit the digestion of any good proteins obtained in the diet. These hardy molecules have been associated with digestive problems, pancreatitis and even pancreatic cancer (Fallon & Enig 2018).

Furthermore, that same chemical process usually leaves behind toxic residual substances, like aluminium - toxic to the nervous system and the kidneys - and hexane spray - a known neurotoxin which can also cause cancer, auto-immune dysfunction, and respiratory problems (NIH 2018). The drying method used can form nitrites - compounds that can form carcinogens (Kaayla 2005). As Fallon and Enig (2018) explain:



Advances in technology make it possible to produce isolated soy protein from what was once considered a waste product – the defatted, high-protein soy chips – and then transform something that looks and smells terrible into products that can be consumed by human beings. Flavorings, preservatives, sweeteners, emulsifiers, and synthetic nutrients have turned soy protein isolate, the food processors' ugly duckling, into a New Age Cinderella.

Ensure Plus, Resource Plus and Nutrison are prime examples of this.

According to the USDA (2018), 91-99% of the soybeans grown in the U.S. (where Ensure Plus is made) are genetically modified, so it is extremely rare to find SPI that doesn't come from genetically altered beans. This means SPI is chemically modified, processed, and contains significant amounts of pesticides. Soy also contains large quantities of natural toxins - often referred to as "antinutrients" - including potent enzyme inhibitors that block the action of trypsin and other enzymes needed for protein digestion. These are large, tightly folded proteins that can produce serious gastric distress, reduced protein digestion and chronic deficiencies in amino acid uptake (Fallon & Enig 2018). This makes soy a very poor choice for those who require significant amounts of easily digestible high-quality protein for the repair and building of muscle tissue – such as those recovering from anorexia. Not only is the integrity of the whole soybean destroyed, but the fragile proteins are further denatured during high temperature processing to make soy protein isolate.

And further still:

In feeding experiments, the use of SPI increased requirements for vitamins E, K, D, and B12 and created deficiency symptoms of calcium, magnesium, manganese, molybdenum, copper, iron, and zinc. Phytic acid remaining in these soy products greatly inhibits zinc and iron absorption; test animals fed SPI develop enlarged organs, particularly the pancreas and thyroid gland, and increased deposition of fatty acids in the liver (Fallon and Enig 2018).

Soy also contains goitrogens which suppress thyroid function. Due to their state of malnutrition people with anorexia commonly experience hypothyroidism as the body strives for self-



preservation. This contributes significantly to the lethargy, depression and cognitive disturbances characteristic of anorexia (Greenblatt 2010, p. 239). Thus, anything that has the strong potential to further suppress the thyroid - such as soy - should be avoided. Soy also contains high levels of phytoestrogens which can block estrogen and have adverse effects on and human tissues and the endocrine system. Once again, those suffering anorexia already have significant endocrinological disruption, and soy only serves to wreak further havoc. Further still, Soybeans (unless fermented) contain more protease inhibitors than any other commonly eaten food. As mentioned earlier, protease inhibitors suppress some of the key enzymes that help the body digest protein. Thus, using soy as a source of protein is largely counterproductive.

These pitfalls of soy do not tend to be as problematic in the context of whole-bean products - such as those consumed by the Japanese. However, in the making of SPI the protein has been separated from other constituents of the whole-bean, which perhaps counteract some of the problematic elements. Also in the final SPI product those problematic elements are present in extraordinarily concentrated amounts (Fallon & Enig 2018, Kaayla 2005).

Fallon and Enig (1995) provide further compelling arguments against the use of refined soy products, including in-depth discussion about why SPI should not be used in Formula™s marketed for either infants or adults. The [Weston Price Foundation](#) also provides a long list of compelling scientific studies carried out between 1971 to 2003 demonstrating the adverse effects of dietary soy on human health.

Due to their direct relevance to refeeding in anorexia., all of the factors discussed above suggest that products containing refined soy are contraindicated.

As discussed, both milk and soy can be considered excellent sources of protein in their whole, natural and undamaged states. However, Fortisip, Ensure Plus, Resource Plus and Nutrison



have used highly processed and denatured versions of both milk and soy as primary ingredients. In addition to the highlighted health risks posed by the degradation of proteins, both of these ingredients are known to cause digestive issues in many people. Hawkins states that contrary to popular belief it is not usually the lactose in milk that is the cause of most people's intolerance to dairy. Instead, "people with food intolerance react to milk's proline-rich proteins called casein and beta-lactoglobulin if their gene is turned on. In Australia this is over 30 percent of the population." (Hawkins n.d. p.3). Due to their malnourished state, people suffering from anorexia tend not only to experience digestive issues, but also various food intolerances.

As Marzola et al. (2013) point out:

Long periods of malnutrition cause physical changes in the muscles, the integrity of the gut wall and digestive enzyme systems of the gut, as well as compensatory metabolic changes in the body to deal with being malnourished.

Thus, it is very common for milk-based products (and foods containing gluten) to be rejected, or at least to cause dispute and non-compliance during treatment of anorexia. Compliance with protein intake during any re-feeding program is so imperative that great care must be taken when considering the sources provided (Greenblatt 2010, Merzola et al. 2013).

Marzola et al. (2013) state further that:

Consuming small amounts of protein of high biological value, in conjunction with the protein source foods that are perceived as less challenging by AN patients (usually of a vegetable source), can help assure a faster restoration of nutrient status even in a continued state of reduced body weight.

In recognition of the immense benefits that whole-food dairy products can have, the meals developed by Lawson Nutrition and Health Science (i.e. the Nourish MEals™) do incorporate (optional) organic, unhomogenised cow's milk kefir, yogurt, and feta cheese for those who prefer/can tolerate dairy. However, for all of the above discussed reasons, cow's milk and all



soy products have been omitted from the ReNourish Formula™. All refined soy products, and (excepting a few optional foods) gluten have been eliminated from the entire range of products offered by Lawson Nutrition and Health Science™. This will place less stress on the digestive system and body, and help to minimise stomach discomfort throughout the difficult process of Renourishment. It is important to note that both animal and plant (whole-food) sources of protein are offered in the Nourish MEals™ (see main document). Hence, when following the Lawson Nutrition protocol sufferers obtain protein from a variety of very high-quality sources.

Although most people do not view plant protein as being as “complete” as animal sources in terms of amino acid profile, this is not entirely true as there are a few plants which provide the complete range of amino acids. These have been selected as the main sources of protein for the ReNourish Formula™. Plant sources of protein are generally more easily digested and usually better accepted and tolerated by people with anorexia, so willingness to drink the supplement is more likely. In addition to protein, nuts and seeds supply a plethora of other beneficial nutrients. They are rich in beneficial fats, though it is important to remember that when heated/roasted the delicate fatty acids are destroyed (causing a health hazard) and thus nuts and seeds should always be consumed raw (as they are in the ReNourish Formula™). Nuts and seeds are also packed with phytonutrients which are not present in animal sources of protein. Phytonutrients can protect and repair the body from the ravages of disease on a cellular level. Some of them have antioxidant effects and others may boost the immune system, or have anti-inflammatory, antiviral, and/or antibacterial properties. Highly coloured vegetables and fruits tend to be highest in phytonutrients, but tea, cocoa/cacao, nuts, seeds, and various oils are also great sources.

The ReNourish Digest-Easy Plant-food Powder is (as the name suggests) an easily digestible, vegan-friendly powder base. Due to their complete amino acid profiles, two of the primary protein sources are Inca Inchi and Hempseed.



Inca Inchi powder (also known as Sacha Inchi) is made from a seed grown and sustainably harvested in Peruvian Amazon rainforests. Due to their health-giving properties these seeds have been consumed for generations as part of the indigenous Peruvian diet. With a 63% protein content, 96% of which is readily digestible, Inca Inchi is one of the most highly digestible, low-allergenic protein powders. Hamaker et al. (1992) determined high levels of amino acid profile of Inca Inchi includes phenylalanine and tyrosine (79 mg/g), leucine (64 mg/g), tyrosine (55 mg/g), isoleucine (50 mg/g), lysine (43 mg/g), cysteine (25 mg/g), threonine (43 mg/g), sulfur amino acids (methionine + cysteine) (37 mg/g), and valine (40 mg/g).

Inca Inchi provides all the essential and non-essential amino acids, as well as omega 3, 6 & 9 oils, with **no high temperature processing, no added preservatives, and no chemical alteration** of the food. It has a sweet nutty flavour and a uniquely high tryptophan content. Tryptophan is used by the brain to make chemicals that regulate mood, sleep and hunger levels. Tryptophan also helps in the regulation of LDL (“bad” cholesterol), which, in spite of their very low fat intake is usually high in patients with anorexia (Greenblatt 2010, p. 171). While Greenblatt suggests this may be due to a lack of EPA fatty acids, it may also be due to a lack of amino acids, in particular tryptophan. According Kummerow (2014), high LDL is not caused by high intake of dietary cholesterol, it is a marker of ApoB, and ApoB is a marker of a lack of tryptophan. Hence, for many reasons tryptophan is imperative in recovery from anorexia.

These properties alone make Inca Inchi a very unique plant-based source of protein, and one that is particularly suited to treatment of anorexia. But further still, Inca Inchi is high in vitamins and minerals - especially thiamine (Vitamin B1), manganese, magnesium, selenium and phosphorous – all of which are typically in high demand during recovery from anorexia, playing numerous roles, such as supporting heart health, thyroid function, cellular repair, and mental wellbeing (Barron et al. 2017, Greenblatt 2010).



Inca Inchi seeds contain the highest percentage of unsaturated fatty acids and lower levels of saturated fat of all oleaginous seeds used worldwide for the production of oils for human consumption and as protein for the production of protein flours. Their high oil content (around 60%), with elevated levels of linolenic (omega-3) and linoleic (omega-6) acids provide a great potential for applications in the food and nutraceuticals industries. The Inca Inchi seed has been called a “superfood” because of its high content of essential fatty acids and amino acids. Similar to Inca Inchi in composition, Hemp seed is also a complete protein source, and has a higher content of essential amino acids than either whey or soy proteins. Hemp’s ability to be digested is also much greater than whey or soy proteins, thereby allowing the body to use it more efficiently. Notably, hemp seed protein has a high proportion of arginine (97mg/g protein) and histidine (23mg/g protein) - both of which are important for heart health, immune support, and cellular growth and repair – and over 61mg/g of protein of Leucine – an essential amino acid required for protein synthesis. Hemp seed is rich in essential fatty acids with a high percentage of omega 3s. Hemp protein is also a rich source of essential minerals, including significant amounts of magnesium, phosphorus, zinc and iron.

While not quite as complete in amino acids, a high percentage of raw pumpkin seed meal was included, primarily for its high zinc content. Greenblatt (2010) emphasises the role that zinc deficiency plays in the aetiology of anorexia, and thus its imperative role recovery.

Most people are unaware that there is an important difference between common pepita seeds and true pumpkin seeds. Sourced from China, pepitas are the unprotected kernel of a regular pumpkin seed, and due to lipid oxidation during processing and packaging are usually rancid once they reach the consumer. True pumpkin seeds come from the Styrian pumpkin and originated through a natural mutation some 300 years ago in the Styrian region of Austria and Slovenia. These are naturally protected from rancidity due to an uncompromised coating. It is easy to tell the difference, as pepitas are small and pale green, while Styrian pumpkin seeds are much larger and very dark green in colour. The ReNourish Formula™ uses premium raw



Styrian pumpkin seeds. Also considered a “superfood”, pumpkin seeds are packed full of nutrients. They are not only high in zinc and easily digestible protein, but also in iron, phosphorus, magnesium, antioxidant vitamins A & E, B group vitamins, carbohydrates and essential fatty acids. In addition to these 3 protein sources, raw activated sunflower seed, and raw flaxseed have also been included, each containing a slightly different nutritional profile. In combination the 5 seeds deliver a complete range of concentrated, easily digestible amino acids as well as a significant concentration of beneficial fats, vitamins, minerals and phytonutrients.

Loaded with both macro and micronutrients, Pratt and Matthews (2004) refer to nuts and seeds and “little nutritional powerhouses” which will “play an important role in maximising the human health span during this century” (p. 222).

They are after all, nature’s nurseries. A nut or seed is basically a storage device that contains all the highly concentrated proteins, calories and nutrients that a plant embryo will require to flourish (ibid. p.223).

Hence nuts and seeds playing such a prominent role, not only in the ReNourish Formula™, but also the entire Lawson Nutrition re-feeding and eating rehabilitation protocol.

Pre- and Probiotics and the biohawk Relief® digestive aid

Contrary to Fortisip, Ensure Plus, Resource Plus and Nutrison, the ReNourish Formula™ addresses gut issues, and promotes the health of the microbiome. High quality pre- and probiotics have been added to the powder base. Like all other nutrients discussed, it was important to select the pre- and probiotics suited specifically to those recovering from anorexia (Greenblatt 2010, p. 158-163).



As Hippocrates wisely declared: “all disease begins in the gut”. Until very recently, it appears that this advice was largely ignored. There is however, a rapidly growing interest in the role of the microbiota in health and disease. While it may seem like an indirect causal factor, there is certainly reason to believe that anorexia is no exception to Hippocrates assertion. Considering the fact that around 85-90% of the serotonin required for mental wellbeing is produced in the gut, it certainly makes sense to postulate that mental disorders stem from gut dysbiosis. While most medical practitioners respond eagerly with the prescription of anti-depressants such as SSRIs, this does not solve the underlying issues and in fact has the potential to do long term harm. Anti-depressants can cause further damage to the gut, and over time patients can develop tachyphylaxis – a rapidly occurring resistance to a specific drug, rendering it useless. As Targum (2014) points out it has been reported that patients with antidepressant tachyphylaxis may be less responsive to subsequent treatment interventions.

Despite the burgeoning evidence surrounding the importance of achieving and maintaining gut health, mainstream medicine still appears reluctant to embrace it as a valid treatment option, particularly in response to mental disorders. Numerous studies reveal a unique communication system between the gut and the brain, commonly known as the “gut brain axis”. When the brain and gut work in harmony, there is balance within the body, both physically and mentally (Hales et al. 2018). Addressing gut issues in sufferers of anorexia is imperative, not only for improvement in mental wellbeing, but as an integral part of the renourishment process. Pre- and probiotics help boost immunity, as they enhance our microbiome and ability to absorb important nutrients and trace minerals from the foods we eat. While probiotics tend to get most of the attention, their existence, proliferation and effectiveness depend on pre-biotics. Acting like the fertilizer in the garden, pre-biotics feed the probiotics (good bacteria) in the gut. Prebiotic fibre also inhibits the growth of bad bacteria (pathogens). The ReNourish Formula™ is rich in both pre- and probiotics. Conversely, the ingredients in Fortisip, Ensure Plus, Resource Plus and Nutrison actually feed the bad bacteria which act to override and deplete stores of



good bacteria, leading to a myriad of minor and major health issues. Anorexia may well be no exception to Hippocrates declaration that “all disease begins in the gut”.

Finally, the ReNourish Powder base also contains biohawk Relief® powder, an ingredient with properties pertinent to the nutritional needs of people with anorexia. This is simply a blend of 3 dried rhizomes from the ginger family (ginger, turmeric, galangal). It is imperative to realise and understand the significance of this product in the overall effectiveness of the Renourish Formula™. In short, the enzymes in these rhizomes break down the proline proteins present in almost every food, enabling the human body to more easily digest that food. This process also protects the body from harmful viruses and autoimmune disorders. As Professor Cliff Hawkins (n.d), Biochemist and creator of Relief® states “If our bodies cannot digest a protein, that protein becomes a threat and our immune system, looks to destroy it, and it will become hypersensitized if it has the gene that recognizes a proline-rich protein” (p.1).

Further, he explains that the unique natural enzymes present in the ginger rhizomes act to:

- digest proline-rich proteins, which are resistant to digestion by our own enzymes, and that occur in all plant-based foods and drinks, plus milk, meat, fish and eggs. These are believed to cause (or at least contribute to) food intolerance, allergy, and other serious diseases. Proline proteins are in the connective tissue of fish and meat and can cause these foods to be tough. Proline proteins also coat the membranes of ‘bad’ organisms such as viruses and harmful bacteria, and it is only by breaking the proline down that the viruses and harmful bacteria can be accessed and killed.
- reduce the risk of autoimmune diseases by digesting the main cause for the T-helper 2 cell (Th2) immune system becoming hypersensitized, allowing it to return to normal levels where autoimmune disease genes are switched-off
- repair damage (caused by everyday living) to our bodies, and
- condition food to release the food’s full mineral, vitamin and energy nutrients that are encapsulated within proline-rich proteins.

(Hawkins, 2018).



Biohawk Relief® is a vital component included not only in the ReNourish Formula™, but also used to negate the proline in all ingredients and drinks in the Nourish MEals™ and snacks. Especially important for people who are malnourished, this enhances the absorption of nutrients and the digestibility of all the food produced by Lawson Nutrition™. As already discussed, people with anorexia commonly experience gut and digestive issues. Relief® helps to alleviate the bloating and gut issues (more information on biohawk Relief® in attachment 3). Moreover, the added pre- and pro-biotics, as well as the high overall omega-3 content of the ReNourish Formula™ also promotes the healing and health of the microbiome (Costantini et al. 2017, Pratt & Matthews 2004).

As explained earlier, all ingredients in the ReNourish packs are gluten-free, and all except one are dairy-free. The cod-liver & butter oil blend does contain trace amounts of cow's milk, however unless a person is strictly vegan, or severely allergic to dairy it should not pose a problem as it is such a minute quantity and encapsulated. Furthermore, since the patient is consuming the Digest-Easy® at the same time any negative effects usually associated with consuming dairy are negated. As Hawkins (n.d.) explains, in addition to negating the proline, the biohawk Relief® ginger powder effectively consumes, and thus eliminates the casein in milk.

CONCLUSION TO NUTRITIONAL COMPARISON

To conclude, the quality of both the nutrient-rich ReNourish powder base and the ReNourish cold-pressed oil blend, especially in comparison to the protein and fat sources in Fortisip, Ensure Plus, Resource Plus and Nutrison, cannot be contested. In addition to providing very high-quality, easily digestible protein, the ReNourish™ powder is a rich source of vitamins and minerals as well as phytonutrients, enzymes and essential fatty acids - all of which are required in amounts higher than the general population for those trying to recover from anorexia (Greenblatt 2010). It was discussed earlier that in comparison the high concentration of refined



sugar found in Fortisip, Ensure Plus and Resource Plus, the lower GI, less refined carbohydrate content of the ReNourish Formula™ may help prevent re-feeding syndrome. Likewise, since the plant protein content of the ReNourish Formula™ is gentler on the kidneys, liver, spleen and digestive system than the whey and soy proteins found in Fortisip, Ensure Plus, Resource Plus and Nutrison, it is hypothesised that this too may play a role in reducing incidences of re-feeding syndrome.

As Rao et al. (2008) point out, “the most common nutritional deficiencies seen in patients with mental disorders are of omega–3 fatty acids, B vitamins, minerals, and amino acids that are precursors to neurotransmitters” (p. 79). Unlike Fortisip, Ensure Plus, Resource Plus and Nutrison, the development of the ReNourish Formula™ has paid special attention to each of these nutrients, ensuring that they are delivered not only in adequate amounts but in easily digestible, bio-available forms.

HOW TO USE THE RENOURISH™ PACK

The ReNourish™ pack is a box which contains the 4 functional ingredient components 3 of which (as explained earlier) are to be blended as a drink, and the 2 nutritional food capsules to be taken with the drink (table 1, p. 46). Ingredients contained in the pack are to be administered in very specific doses just as current nasogastric feeding is, and/or as any pharmaceutical drug would be. This should only be altered upon medical advice provided after blood testing which indicates a need to increase or decrease a certain nutrient. The ingredients are to be taken in the following amounts per serving (recipe makes approx. 300ml):



Table 1: ReNourish Formula™ pack contents and dosages

COMPONENT (to be blended with 250ml water)	TOTAL AMOUNT INCLUDED IN RENOURISH PACKAGE	DOSAGE PER SERVE	SERVINGS PER PACKAGE
1. The ReNourish™ Phytonutrient, Polyphenol & Plant Protein Powder	1kg	50gm	20
2. ReNourish™ Cold-pressed Oil Blend	500ml	25ml	20
3. Australian Bee Pollen	200gm	10gm	20
WHOLE FOOD CAPSULES:			
4a. Royal Jelly	120 capsules	1 capsule with each drink	60
4b. Cod-liver Oil with High Vitamin Butter Oil	120 capsules	1 capsule with each drink	60

NOTE 1: The recipe (to be included in the pack) also recommends the user to blend 1 small banana OR ¼ small avocado into the drink. This not only enhances the taste and texture of the drink, (especially if frozen prior to blending) but also boosts the potassium level. Banana and avocado are both very easily digestible and, in addition to potassium, they add other important nutrients including magnesium and fibre.

NOTE 2: There will be 2 different ReNourish packs available – one standard pack, and one Allergy and Vegan pack. The above recipe is for the standard formula. The latter will accommodate those with seafood and/or bee product allergies, and is also suitable for vegans. As such it will exclude the Bee Pollen granules, the Royal Jelly capsules, and the Cod-liver & Butter oil capsules. In lieu of these ingredients the Vegan & Allergy pack includes black seed oil and Co-enzyme Q10 capsules, which, while not providing quite the same nutritional benefits, are appropriate substitutes.

While the ReNourish Formula™ is designed to be a supplement to solid food, if the sufferer is refusing to eat solid food it can act as a substantial source of nutrition until solid food is introduced. The number of doses to be taken each day is determined by the individual sufferer's fluctuating needs, dependent on how much solid food is being consumed. As Marzola et al. (2013) explain:



The use of medical foods that are acceptable to the AN patient may also be considered when patients cannot eat a sufficient amount of food to achieve weight restoration or as a useful addition in case of unstable weight maintenance. Medical foods may reduce the stomach and gastrointestinal discomfort that refeeding with more caloric dense food may exaggerate. Moreover, it has been showed that in AN patients there is a delayed gastric emptying of solid but not of liquid meals therefore liquid supplementations can be a well-tolerated intervention mostly at the beginning of refeeding treatment.

As users progress in their recovery journey they should slowly reduce dependence on the ReNourish Formula™ by increasing their intake of solid foods. The Whole HealthCare™ program provides a step by step protocol to guide and facilitate this, or the sufferer may require support from an independent nutrition consultant.

It is advised that sufferers be supervised 1:1 in the preparation of all ReNourish™ drinks to safeguard correct dosage of each ingredient. While the need for this will be individual it is in the nature of the illness to try to omit or skimp on the dosage of certain ingredients (e.g. the oils which are crucial to brain health) and thus for many it is imperative that correct dosage is observed. Very reluctant and/or cognitively impaired sufferers in the early stages may require someone else to measure ingredients but this should be judiciously assessed on an individual basis. The ReNourish™ is designed to engage the sufferer in food preparation. This will help the individual to appreciate the important role that each ingredient plays in nurturing her/his body, cultivate empowerment, and encourage responsibility for feeding her/himself, all of which are critical parts of successful recovery. This is in stark contrast to most hospital-based programs where a plastic-packaged synthetic supplement drink is simply handed to the sufferer with no sense of nurture and no requirement for responsibility. On the contrary, it is often punitively enforced. The preparation and consumption of the ReNourish Formula™ is supposed to be a nourishing experience for the user – both physically and emotionally. Even the small attractive re-usable glass bottles and straws provided in the packs are designed to enhance the experience of re-feeding, and reinforce self-care and self-worth. This is in stark



contrast to the non-recyclable, single-use plastic bottles given to patients and thrown into landfill rubbish several times a day.

The packs are designed to provide 20 doses of each part (table 1). If dosage directions are properly followed each part should run out at the same time, though if for some reason more of one product is needed each part can be ordered separately. As the stock runs low a new package can be ordered online. Each ingredient included in the pack has one or more specific medicinal function/s, and have been sourced from certified companies to ensure premium, pure, and trustworthy quality.

CONCLUSION

As promoted throughout this paper, nature is far better at designing and producing health-promoting foods than man and his industrial Resource Pluss. Significant advances have been made over centuries, and indeed just the last few decades, in terms of identifying and analysing the various nutritional components of the food we eat. This has enabled identification of the health-promoting properties of various foods, which has led to an industry which promotes certain nutrients in their isolated (often synthetic) state. Unfortunately, this overlooks the knowledge that whole foods contain a natural balance of nutrients which work synergistically, the importance of which is lost when the food is deconstructed and one (or more) of the nutrients is removed. Isolation of nutrients disregards the synergistic nature of whole foods, and synthetic replication of isolated naturally-occurring nutrients disregards the bio-availability of natural forms. There is (arguably) nothing that better exemplifies the phrase “the whole is greater than the sum of its parts”, than whole food.

The information presented in this paper illustrates that the ReNourish Formula™ is of resounding superiority in terms of quality of ingredients, naturally-derived nutrition, and



overall benefit to the user. It contains a vast spectrum of bio-available vitamins, minerals and phytonutrients that are absent in Fortisip, Ensure Plus, Resource Plus and Nutrison. It can be contested that Fortisip, Ensure Plus, Resource Plus and Nutrison are in fact the absolute antithesis of what they claim to be. Cleverly marketed and disguised as medical-grade “nutrition”, they are merely an artificially fortified concoction of potentially harmful substances – a very poor substitute for natural, nutrient-rich whole food. Laden with refined sugars and starches, denatured proteins and cheap vegetable oils, it is fair to suggest that they pose more harm than benefit to human health. Due to the toxic effect on health, experts such as Kummerow (2014) warn vehemently against the consumption of oxidised lipids and proteins like those found in the aforementioned supplements. Similarly, there are numerous studies implicating refined sugar in a range of serious physical and mental health issues (Corliss 2016, Knüppel et al. 2017, Basciano et al. 2005). Considering the low-grade ingredients – synthesised and adulterated in the name of cost-cutting and preserving shelf-life at the expense of preserving and providing nutritional value - it is also logical to infer that these products are designed more in the interest of profits than the best interest of the patient.

It is not only contradictory to the principle of health care, but unethical to be feeding such poor quality, inferior faux-nutrition to people who are malnourished, especially in a first world country where an abundance of appropriate, natural and beneficial ingredients is readily available. Moreover, as this paper illustrates, an enormous amount of time, money, human energies and other Resource Plus go into refinement of some ingredients, and the synthetic chemical fabrication of others which constitute supplements such as Fortisip, Ensure Plus, Resource Plus and Nutrison. The end result is a single-use disposable plastic bottle containing faux-nutrition which, while touted as a “medicine”, is in fact a potential threat to the health of those who are already ill. Hence, the production, distribution and use of these supplements is not only a complete waste of various Resource Plus, but a hazard to both the environment and human health. Once again, it appears that all of the time, money, human energies and other Resource Plus put into producing and distributing those products is invested for the



purpose of profit, not authentic health care. Far superior health outcomes with far less impact on the environment could be achieved through the utilisation of the ReNourish Functional Food Formula™.

While products like Fortisip, Ensure Plus, Resource Plus and Nutrison are undeniably effective in terms of inducing rapid weight gain, that is not an adequate criterion on its own for its utilisation as an appropriate part of treatment; nor is it an acceptable measure of efficacy and benefit to the patient. Good and ethical medicine is that which is practiced according to the best known scientific truth; not simply according to tradition or trend, nor convention, convenience or commerce. It must, without exception, apply this truth to acting in the best interest of the patient, and never in the best interest of profit. It is time for all factions of the health sector to place patients ahead of profits. RED HOUSE and Lawson Nutrition and Health Science™ are not-for-profit enterprises and thus, unlike commercial food and pharmaceutical companies, have no vested financial motivation for selling the ReNourish™ product. It is produced and distributed solely for the purpose of providing concentrated **quality** nutrition to the patient, in the best interest of patients and outcomes; not profits.

Considering the myriad of superior ingredients provided in the ReNourish Functional Food Formula™ compared to those in Fortisip, Ensure Plus, Resource Plus and Nutrison, it is reasonable to postulate that a trial where the latter liquid supplements are replaced by the ReNourish Formula™ will generate improved physical and mental health outcomes in sufferers of anorexia.

Let Food Be Thy Medicine and Medicine Be Thy Food
-Hippocrates-



ATTACHMENTS

Attachment 1:

Specifications for the ingredients contained in the ReNourish Functional Food Formula™: their nutritional profiles and functional roles in the treatment of anorexia

1. The ReNourish™ Phytonutrient, Polyphenol & Plant Protein Powder

Organic Coconut Milk Powder (vegan) 20%
Organic amaranth 2.5%
Organic chia 2.5%
Organic millet 2.5%
Organic quinoa 2.5%
Organic hemp seed powder 10%
Organic Inca Inchi powder 10%
Organic Mesquite powder 10%
Organic dried banana powder 5%
Organic sweet potato (resistant starch) powder – 2.5%
Organic pumpkin seed meal 5%
Organic walnut meal 5%
Coconut water powder 5%
Organic green Kiwi Fruit powder 5%
Organic date powder 5%
Probiotic 2.5%
BioHawk Relief® Powder (Ginger/Turmeric/Galangal) 2.5%
Black Pepper 0.5%
Organic Australian Dunella Sativa powder (Algae) 1%

Overview of benefits:

- Rich in phytonutrients and polyphenols
- Easily digested protein – full array of essential and non-essential amino acids
- A balance of essential fatty acids:
 - Omega-3 Alpha Linolenic Acid (ALA)
 - Omega-6 Linolenic
 - Omega-9 Oleic
- No harmful sources of fat (e.g. refined vegetable oils)
- Complex carbohydrates with **no refined sugars**
- Soluble and insoluble dietary fibre
- High in Minerals: especially thiamine (Vitamin B1), potassium, manganese, selenium, magnesium and phosphorous



- The biohawk Digest-Easy® snips the proline proteins, reducing bloating and potential of allergic reactions, and making food more easily digestible (**see attachment 3 for details**)
- **Contains Dunaliella salina (Alge):**

Algae is a nutrient-dense natural food and medicine that has been used safely for thousands of years by the Aztecs, some African and Asian peoples and South Pacific islanders. Examples of popular edible algae promoting good health used around the world include Spirulina and Chlorella. Dunaliella salina, however, offers a number of distinctive benefits over these other algae. Today the nutritional and health benefits of algae are being rediscovered.

Natural vs. synthetic: Natural is best

Dunaliella salina is a single-celled green algae that lives in coastal waters, brine rock pools and salt water lakes. Dunaliella is adapted to life in highly concentrated salt water – it is one of the most salt tolerant life forms known.

Dunaliella salina is nature's richest known source of dietary beta-carotene. 1gm can supply more beta-carotene than 1kg of carrots! Natural dietary beta-carotene is an antioxidant containing provitamin A that is converted to retinol (vitamin A) in the body as required. Research suggests that natural food-based beta-carotene is safe to consume and is a more potent antioxidant than the synthetic form found in some multivitamin formulations.

Natural vs. synthetic

Dunaliella salina contains natural beta-carotene, with a rich blend of carotenoids and should not be associated with synthetic beta-carotene. Synthetic beta-carotene contains only all-trans beta-carotene isomers. Only natural beta-carotene contains the 9-cis isomer, a far more efficient antioxidant than the all-trans isomer. Natural beta-carotene is a more potent antioxidant as it contains both all-trans and 9-cis beta-carotene isomers. Dunaliella salina also contains a spectrum of other health and vitality boosting phytonutrients including proteins, amino acids, essential fatty acids, carbohydrates, vitamins, minerals and chlorophyll. Dunaliella salina is arguably the most nutrient dense food source known. On a gram per gram basis, Dunaliella salina can contain more than twice the chlorophyll of Spirulina, 8 times the mineral content and over 6,000 times the antioxidant content. The antioxidants found in Dunaliella assist the body with natural detoxification processes. Dunaliella salina is a natural source of vitamins, minerals, amino acids, polysaccharides, essential fatty acids, chlorophyll and phytonutrients. It contains many of the antioxidants commonly found in fruit and vegetables. As it is a soft wall phytoplankton it is very easy to digest, particularly for those with sensitive stomachs.

Dunaliella salina is a rich source of essential fatty acids and amino acids, the basic building materials required to make cells, skin and connective tissue. It also contains many vitamins, including vitamin E, cobalamin (vitamin B12) and electrolyte minerals, such as magnesium, selenium and sulphur that are necessary cofactors in cellular energy production. Magnesium in particular assists in healthy cellular metabolism, energy production, nerve and muscle function. Selenium assists cellular detoxification and sulphur supports phase 2 detoxification of the liver.

Dunaliella salina contains a mixture of natural carotenoids including beta-carotene, alphacarotene, lutein, zeaxanthin and cryptoxanthin. Carotenoids are the pigments responsible for the red, orange, yellow and green colours of fruit and vegetables. Carotenoids can help to support a healthy immune system. The antioxidant properties of carotenoids help to protect against free radical cell damage and lipid based oxidation. Beta-carotene (pro-vitamin A) can also help in maintaining eye health.



- **Pre- and Pro-biotics used in the ReNourish Functional Food Formula™:**

Life-Space probiotics is guaranteed to contain live bacteria. The freeze-drying process of all bacterial strains, manufacturing techniques employed, and packaging used ensures the viability and quality of all Life-Space probiotics. The number of live bacteria for any Life-Space probiotic is stated on the product's label. Life-Space Broad Spectrum Probiotic Powder is a premium, multi-strain probiotic Formula™ containing 15 strains of beneficial bacteria. Specifically Formulated to support general health and wellbeing, digestive health and immune health.

More information: <https://www.lifespacprobiotics.com/product/broad-spectrum-powder/>

2. **ReNourish Cold-pressed Oil Blend (ALL COLD-PRESSED):**

10% pumpkin seed oil

10% avocado oil

10% Almond oil

10% Macadamia oil

30% flaxseed oil

30% walnut oil

This particular blend was developed through research on which oils could provide most benefit to people suffering the specific nutrient deficiencies common to anorexia:

COLD-PRESSED PUMPKIN SEED OIL:

Pumpkin seed oil's main nutrients are: essential fatty acid – Omega 6, Omega 9, zinc, Vitamin A & E, antioxidants, phytosterols, carotenoids. Pure Pumpkin Seed Oil Fatty acid profile:

- Linoleic Acid (Parent Omega 6) 64.2%
- Oleic Acid (Omega 9) 11.3%
- Palmitic Acid 14.6%
- Stearic Acid 9.9%

COLD-PRESSED WALNUT OIL:

The health-promoting benefits of walnut consumption are ascribed to its fatty acid profile, which is rich in polyunsaturated fatty acids with a particularly high omega-3 to omega-6 ratio - the highest among all the tree nuts. According to Hayes et al (2015) "the content of polyphenols and other phytochemicals in walnuts, with their claimed cytotoxic properties, also make them an attractive candidate for research for the prevention of free radical-induced nucleic acid damage. Research of walnut consumption in humans and animals employing a range of data sets and statistical methods suggest that walnuts may be considered a safe potential nutraceutical or possibly pharmaceutical substance". a meta-analysis and systematic review by Banel and Hu (2009) found that



high-walnut-enriched diets significantly decreased total and LDL cholesterol and that walnuts appear to beneficially affect CVD risk. Walnut oil is also rich in manganese and copper, as well as melatonin – all of which can be highly beneficial in the treatment of anorexia.

More information: <https://www.tandfonline.com/doi/abs/10.1080/10408398.2012.760516>

COLD-PRESSED MACADAMIA NUT OIL:

COLD-PRESSED FLAXSEED OIL:

Flaxseed oil is derived from the seed of the flax plant (*Linum usitatissimum*). Flaxseed oil is one of the richest sources of omega-3 essential fatty acids (ALA) - at 55-60%.

3. Australian Bee Pollen

Bee pollen has been included in the ReNourish pack as it is known as “nature’s perfect food”. Each little grain is a nutritional “powerhouse” **containing all 22 amino acids as well as every other nutrient required by the human body**. Bee pollen is particularly rich in B Vitamins, and many other nutrients commonly deficient in those with anorexia.

Bee pollen contains pro-vitamin A, vitamins B1, B2, B3, B5, B6, B12, C, D, H, K, PP, essential fatty acids, folic acid, pantothenic acid and rutin. Bee pollen also contains amino acid proteins and phosphates. Bee Pollen has also been traditionally used for its energy boosting and immunity strengthening properties.

Warning: This product can cause severe allergic reactions in some people. This ingredient is excluded from the Vegan packs which should be ordered by those with known bee product allergies.

4. Royal Jelly (capsules)



Royal Jelly is an extremely complex substance, and rather enigmatic in that modern science has not yet been able to fully analyse it. The beneficial effects of Royal Jelly are thought not depend on its nutrients alone, but on some type of enzymatic or catalytic action generated within - that is, synergistic interactions between all the live nutrients activating the glands of internal secretion to stimulate and speed up cell metabolism and body processes. This is referred to as “Mother Nature’s Secret Way”. Studies show Royal Jelly contains all the B Vitamins (especially rich in pantothenic acid), nucleic acid, all the essential amino acids, all essential fatty acids - especially the famous 10-HDA (hydroxy monounsaturated fatty acids), acetylcholine, collagen, lecithin, gamma globulin, beta sitosterol, enzymes, hormones (natural estradiol and testosterone), essential vitamins and minerals. In addition, Royal Jelly also has powerful natural antibacterial and antibiotic properties.



5. Blue Ice Royal Fermented Cod-liver Oil with High Vitamin Butter Oil (capsules)



Blue Ice Royal is a nutrient dense blend of 1/3 X-Factor Gold High Vitamin Butter Oil and 2/3 Blue Ice Fermented Cod-liver Oil. The blend was inspired by Dr Weston A Price - a dentist, Nutritional Medicine researcher and pioneer, and author of 'Nutrition and Physical Degeneration'.

This is the best combination of two health boosting ingredients and contains very concentrated levels of vitamins. The Blue Ice Fermented Cod-liver Oil is lacto-fermented and extracted without heat. The fish are wild caught in the Arctic region. X-Factor Gold High Vitamin Butter Oil is made from dairy oil extracted without heat from cows that eat 100% rapidly growing grass. The speed of the grass growth, timing of the grazing of this grass, species of grass, climate and extraction method are all important to make real X-Factor Gold High Vitamin Butter Oil.

The combination of these attributes provides a pure, clean, and nutrient rich food. Dr Price found that combining butter oil and cod-liver oil enhances the effectiveness of this super food. He stated that “one without the other did not do my patients justice, but the two together worked like magic”. This may be in part due to the fact that grass-fed butter is one of the few foods to contain Vitamin K2, which enhances the absorption of Vitamin D, and works synergistically with other nutrients.

Green Pasture uses a cold process extraction and cleaning method followed by lacto-fermentation to produce this pristine and naturally fresh cod-liver oil. Blue Ice Fermented Cod-liver Oil is batch processed and independently tested to international purity standards. Fermentation increases the level of quinines by 700-1600%. Quinones include vitamins E, K, coenzyme Q10, and many other beneficial compounds. To the best of our knowledge Green Pasture is the only brand of cod-liver oil that uses lacto-fermentation, rather than harsh cleaning and deodorizing using heat and chemicals, and only the natural vitamins that come from the fish. Many other brands of cod-liver oil are processed to remove all the vitamins A and D and then non-fish (lanolin) or synthetic vitamins A and D added back in. These synthetic versions of A and D are not easily absorbed by the human body and, in synthetic form, vitamin A can even be toxic.

As a world-renowned dentist, Dr Price discovered that Cod-liver oil reduces the risk of dental caries. Dr Price used extracts from grass-fed butter (activator X), in combination with high-vitamin cod-liver oil (A and D), to prevent and reverse dental cavities in many of his patients. The book 'Nutrition and Physical Degeneration' contains X-rays of case studies showing re-calcification of severe cavities using this combination. This is particularly pertinent to many people with eating disorders. Common binge-purge behaviours readily cause dental caries and erode enamel. Enamel is the most mineralized substance in the human body. It is made up of mostly calcium and phosphate. Vitamin D is important for increasing the absorption of calcium and phosphate from the food you eat. Increasing the absorption of calcium and phosphate can improve the strength of your teeth and their ability to fight demineralization from bacteria. Vitamin D increases the amount of good antimicrobial proteins in your body which help to fight the bacteria that cause dental caries. In addition, vitamin D helps form dentin and enamel in teeth. A 2013 review from the USA found that taking vitamin D supplements resulted in a 47% reduced rate of dental caries.



COLD-PRESSED BLACK SEED OIL:

Black Seed (*Nigella Sativa*), also known as Black Cumin, has long been used for its medicinal properties in Asia and the Middle East for illness such as indigestion, loss of appetite, fever, diarrhoea, general weakness, chest congestion, asthma and arthritis. This unassuming little aromatic seed has been revered for centuries as a remedy to restore the body's natural balance, strengthen its defenses and to treat many chronic diseases. More recently, there has been an increasing amount of research in support of the healing effects of Black Seed, something that has been assumed for centuries, but can now be proven scientifically. Black Seed is now known to have many beneficial effects, mainly due to its antioxidant, anti-inflammatory and anti-bacterial properties.

Thymoquinone (TQ), a highly volatile oil, has been identified as the main active constituent in Black Seed and has not been found anywhere else in nature. TQ has been extensively studied and has been found to possess excellent anti-inflammatory and anti-oxidant activity. Other important volatile oils include: dithymoquinone (nigellone), thymohydroquinone, p-cymene, carvacrol, 4-terpineol, t-anethol, sesquiterpene longifolene, α -pinene and thymol. Black Seed also contains essential and unsaturated fatty acids, comprising approximately 58% linoleic acid. It also contains carbohydrates, proteins, fibre, vitamins and minerals - predominantly potassium, phosphorus, sodium and iron.

Hab Shifa Black Seed Oil is extracted from the Black Seed using the cold-pressed method. No heat or chemicals are used in extracting the oil from the seed – ensuring that the constituents of the Black Seed remain untouched and unaltered. Hab Shifa is well known for the quality of their Black Seed Oil products, which are sold throughout Australia. Hab Shifa Black Seed Oil is manufactured in Australia to strict Australian Standards and all of their products are TGA approved. The seeds are sourced directly from farms in India (GMO free) and the extraction and packaging processes are overseen by Hab Shifa.



Attachment 2:

Ingredients in the refined liquid supplements most commonly used for re-feeding in anorexia and other disorders of malnutrition: Fortisip, Ensure Plus, Resource Plus and Nutrison

Fortisip Compact Protein Liquid (Vanilla flavour):

water, maltodextrin, milk protein (sodium caseinate), sucrose, vegetable oil (canola oil, sunflower oil), tri potassium citrate, emulsifier (soy lecithin), flavour (vanilla), magnesium chloride, acidity regulator (citric acid), tri calcium phosphate, carotenoids (contains soy) (β -carotene, lutein, lycopene), choline chloride, calcium hydroxide, potassium hydroxide, sodium L-ascorbate, ferrous lactate, zinc sulphate, colour (curcumin), magnesium hydroxide, nicotinamide, retinyl acetate, copper gluconate, DL- α tocopheryl acetate, sodium selenite, manganese sulphate, calcium D-pantothenate, chromium chloride, D-biotin, cholecalciferol, thiamin hydrochloride, pteroylmonoglutamic acid, pyridoxine hydrochloride, cyanocobalamin, sodium molybdate, riboflavin, sodium fluoride, potassium iodide, phytomenadione.

source:

http://www.nutriciamedical.co.nz/media/catalog/product/f/o/fortisip_dec_2016.pdf

Ensure Plus Original Ready to Drink Shake Vanilla / 8 fl oz (237 mL):

Water, Sugar, Corn Maltodextrin, Milk Protein Concentrate, Blend of Vegetable Oils (Canola, Corn), Soy Protein Isolate, Short-chain Fructooligosaccharides, Nonfat Milk. Less than 0.5% of: Magnesium Phosphate, Natural & Artificial Flavor, Potassium Citrate, Cellulose Gel, Salt, Calcium Carbonate, Calcium Phosphate, Choline Chloride, Ascorbic Acid, Sodium Citrate, Cellulose Gum, Potassium Chloride, Monoglycerides, Soy Lecithin, Carrageenan, Potassium Hydroxide, Ferrous Sulfate, Zinc Sulfate, dl-Alpha-Tocopheryl Acetate, Niacinamide, Manganese Sulfate, Calcium Pantothenate, Copper Sulfate, Thiamine Hydrochloride, Pyridoxine Hydrochloride, Vitamin A Palmitate, Riboflavin, Chromium Chloride, Folic Acid, Biotin, Sodium Molybdate, Potassium Iodide, Sodium Selenate, Phylloquinone, Vitamin D3, and Vitamin B12. Contains milk and soy ingredients. Source:

<https://abbottnutrition.com/Ensure-Plus-original-therapeutic-nutrition-shake>



Nestle Resource Plus Vanilla Flavour:

Water, Maltodextrin, Sucrose, Vegetable Oils (High Oleic Sunflower, Low Erucic Rapeseed), Milk Proteins (Sodium and Calcium Caseinates), Soy Protein Isolates, Minerals (Calcium Phosphate, Sodium Citrate, Potassium Chloride, Potassium Citrate, Magnesium Oxide, Ferrous Sulphate, Zinc Sulphate, Manganese Sulphate, Copper Sulphate, Chromium Chloride, Sodium Molybdate, Sodium Selenate, Potassium Iodide), Acidity Regulator (E330, E525), Choline Bi-Tartrate, Emulsifier (Soy Lecithin), Stabilizers (E460, E407, E466), Vitamins (C, E, Calcium Pantothenate, Nicotinamide, B6,A, B1, B2, Folic Acid, K1, Biotin, D3, B12), Natural and Artificial Flavourings. Source: <https://www.ncare.net.au/nutrition-products/oral-supplements-1/Resource/Plusaplus237ml-1>

Nestle Nutrison (for enteral feeding) Product Ingredients:

Water, maltodextrin, vegetable oils, whey protein concentrate (from milk), sodium caseinate (from milk), pea protein isolate, soy protein isolate, emulsifier (soy lecithin), magnesium hydrogen phosphate, tri potassium citrate, tri sodium citrate, calcium carbonate, potassium hydroxide, potassium chloride, fish oil, tri calcium phosphate, carotenoids (contains soy) (b-carotene, lycopene, lutein), choline chloride, sodium chloride, sodium L-ascorbate, ferrous lactate, zinc sulphate, nicotinamide, retinyl acetate, DL-a-tocopheryl acetate, copper gluconate, sodium selenite, manganese sulphate, calcium D-pantothenate, chromium chloride, D-biotin, cholecalciferol, folic acid, thiamin hydrochloride, pyridoxine hydrochloride, sodium molybdate, riboflavin, sodium fluoride, potassium iodide, phytomenadione, cyanocobalamin. Source: http://www.nutricia.ie/products/view/nutrison_energy



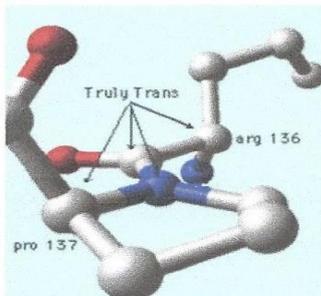
Attachment 3: The biochemistry underpinning the important function of biohawk Relief®

FOOD INTOLERANCE AND ALLERGY

Clifford J Hawkins BSc PhD DSc
Biohawk

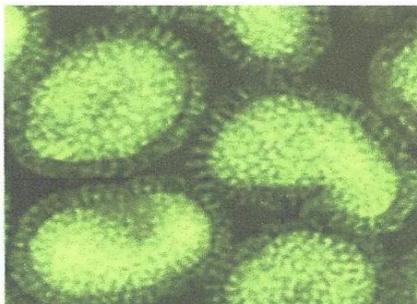
Hippocrates was born on the island of Kos in Greece in 460BC. He is recognized as the founder of modern medicine and medical graduates around the world swear a Hippocratic Oath at their graduation to follow the ethical principles laid down by Hippocrates. His medicine today would be considered as "alternative" or "natural" medicine and its fundamental thesis was that **"All disease begins in the gut"**.

This is the thesis I am presenting in this lecture.



Proline

The key parameter in my presentation is the role of the amino acid proline, which is unique amongst the common amino acids that make up the structure of proteins, in that it causes the protein chain to be fixed in a 90° bend. Proteins are normally very flexible and can adapt their three-dimensional structures to fit a particular protease enzyme's active cavity so that the protein can be digested. The fixed structure imposed by the proline makes it impossible for the usual protease enzymes to digest proline-rich proteins and that includes the protease digestive enzymes in our bodies. If our bodies cannot digest a protein, that protein becomes a threat and our immune system looks to destroy it and it will become hypersensitized if it has the gene that recognizes a proline-rich proteins.



Protection

Viruses and bacteria evolved long before man. For those organisms to function and to invade hosts such as the earlier evolving animals, they expressed on their surface membranes proteins that could not be digested within their hosts. **An influenza virus is shown on the left.** The hairs on the surface are two proline-rich proteins called hemagglutinin and neuraminidase that interact with host cells to allow the virus to enter the host cell and multiply. The hosts' digestive systems cannot remove these proteins from the virus' membrane. Over the evolution of these organisms they have conserved their prolyl peptides in these proteins while undergoing regular mutation and changes to the other amino acids in the proteins' structures.



Throughout the evolution of **Homo sapiens** up until the end of the last ice age and the Palaeolithic periods 10 thousand years ago, those people with the HLA DQ2 or DQ8 immunity gene that gave them an innate immunity to proline-rich proteins on the membranes of viruses and bacteria, became the dominant proportion of people on earth. People with different immunity genes succumbed to these micro-organisms. The Palaeolithic people selected their food carefully so they remained healthy and ate mainly lean meat, seafood, starchy tubers such as yams, some leafy vegetables, some fruit and some nuts all of which did not make their immune systems hypersensitive and cause autoimmune diseases. Our aboriginal people came from the same genetic stock and were healthy and fit before Europeans gave them wheat flour and alcohol. Prior to the Europeans, they chose their food very carefully to ensure they remained healthy.

The other animals evolved to have similar immunity genes to Homo sapiens.

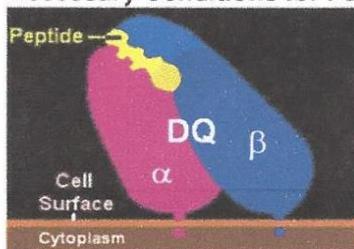


When plants evolved, they protected themselves against animal predators including insects by laying down proline-rich proteins within their structures. They encapsulated their starch, oils, vitamins, minerals and even their main flavour components within a capsule coated with proline-rich proteins (see below). Palaeolithic man was able to select through trial and error natural plant foods that were available that did not hypersensitize their immune system and make them sick.

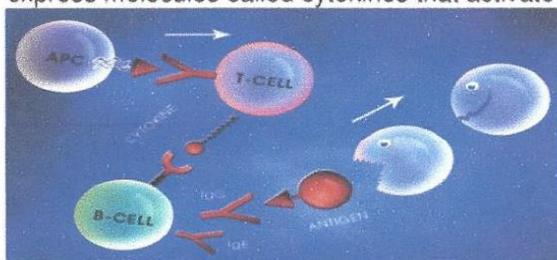
A major change in the evolution of mankind occurred at the end of the last ice age 10 thousand years ago. New grasses grew all over the world: a corn variety in the Americas, rice in Asia, and wheat near the Black Sea. People recognized that these new grasses could be easily cultivated, that the grains gave excellent flour, and that wild yeasts were able to make alcohol from the flour. The people also recognized that these grains were a good feed for animals and it was now possible to domesticate cattle and other animals on a large scale. This was the beginning of agriculture and the concept of agribusiness: these grains, their flour, the alcohol and the domesticated animals and their milk could be traded. Income became more important than the health impacts of the food on man and the animals. Sadly wheat and corn had high concentrations of proline-rich proteins. Rice proteins were not so bad and could be more easily digested. Wheat was traded in a westerly direction because rice was successful in the east. The people with the special gene that recognized proline-rich protein progressively died off from autoimmune diseases and a reduced fertility reducing the proportion of people with this special gene. People in Africa recognized the problem, and when wheat entered Africa, they learnt to remove the problem by fermenting the grain before using the flour. Some tribes refused to eat wheat in modern Lebanon, in Sardinia, and in the Celtic regions of western and Northern Europe. The proline-rich foods have only been introduced to these people's diets in relatively recent times and the HLA DQ2/8 gene still dominates. This gene has been re-introduced into Eastern Mediterranean and Eastern Europe countries over the past few thousand years through the Mongol invasions and the movement of people from Africa and the Middle East into these regions.

The HLA DQ2/8 gene is handed on to progeny 100 percent and so in a country such as Australia, those people with this gene mostly come from the Celtic and Eastern Mediterranean peoples as well as from Asia, Africa and our own Aboriginal people. The percentage varies across the country with high percentages where Scots settled such as in Tasmania, and for example in New England, and where the Irish settled, and where there are high numbers of people with Aboriginal or Islander descent. The percentage is certainly greater than 30 percent averaged over all of Australia. These are the people who at very high risk of food intolerance, and the associated autoimmune diseases including the full range of cancers.

Necessary Conditions for Food Intolerance



To suffer from food intolerance, three conditions are necessary. The **first necessary condition** is that you have to have the HLA DQ2 or DQ8 gene. The immunity gene expresses a pair of associated proteins that have a cavity with a geometry that allows a specific antigen to be bound and for DQ2/8, this has to be a proline-rich peptide. The pair of proteins and the bound antigen are expressed on the membrane of a special white cell as depicted in the figure to the left. This causes the release of immune T cells and B cells designed to respond to this protein complex. The T cells express molecules called cytokines that activate the B cells to express antibodies such as IgG or IgE that target the antigens to remove the threat through macrophages taking up the antigen-immunoglobulin complex..

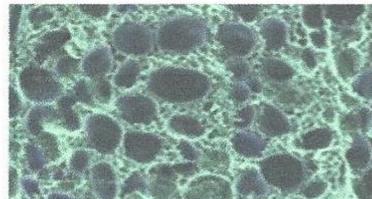
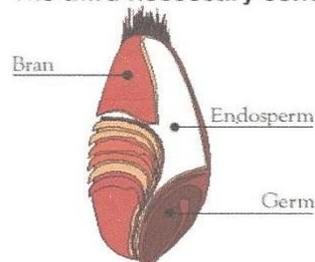




The **second necessary condition** for food intolerance is your immunity gene has to be activated. It may never be activated in your whole life. Your **first serious infection** will cause an immune response, for example, an influenza or scarlet fever infection. Your HLA DQ2/8 gene will prevent you having a second infection, irrespective of which virus or Gram-positive bacterium you are exposed to. **Vaccination** with a proline-rich membrane protein or a live vaccine will turn on your HLA DQ2/8 gene, and in Australia the very successful vaccination program has turned on the HLA DQ2 or DQ8 gene in those children with the gene under 20 years of age in 2013. The vaccination program is very important for the total population to reduce the risk of major outbreaks of serious diseases, but it is also important for governments and the medical profession to understand that for a very significant proportion of the population with the food intolerance gene, they are now at a higher risk of having their immune system hypersensitized at a much earlier age than in the past (before the effective vaccines were created) by the food they eat daily and they are at a higher risk of having autoimmune diseases early in their lives. **Stress** including stress from over-exercise will turn on your immunity gene.

If a pregnant mother has food intolerance, her new-born baby will emerge into this world with its HLA DQ2/8 gene turned on. This presents a serious problem. Some babies smell the casein in the breast milk, which is a proline-rich protein, and the baby refuses to latch on to its mother's breast. Others drink their mothers' milk and react badly with colic, vomiting and fits. The necessary calcium and phosphorus and other nutrients are not taken up. Often the solution provided is a milk or soy formula which is far worse. Thankfully, one drop of a ginger solution we have developed put under the baby's tongue before each feed overcomes the problem instantly.

The **third necessary condition** for food intolerance is you eat food with proline-rich proteins



Electron micrograph of barley endosperm with starch granules (grey) embedded in protein matrix (green). Adapted from Black (2001)

Wheat is given most of the blame. It has about 50 percent of its proteins proline-rich. They are called gluten proteins. Other cereals such as barley have similar proteins. They encapsulate the starch, the minerals and their vitamins in a capsule stopping you gaining access to their energy source necessary for germination. If your HLA DQ2/8 gene has been turned on, your immune system detects the proline-rich proteins such as gluten and if you eat wheat or other cereals each day, you are effectively being vaccinated each day. The same applies to other proline-rich foods.

Your immune system becomes hypersensitized and your health is compromised. Your digestive enzymes cannot digest gluten and related proteins and this encapsulated energy passes into the hind gut where bacteria ferment it making your hind gut become acid killing off your good gut bacteria and allowing your bad bacteria to prosper putting toxins and different to normal fatty acids into your blood.

The second food people blame for food intolerance is milk from cows, goats and sheep. The health industry often blames lactose but this is a relatively small problem in Australia, specifically for people with the autoimmune disease called Coeliac Disease who have had their small intestine villi, where lactase is produced, seriously damaged and for people who have not been given animal milk after weaning from their mother's milk and their body has forgotten how to produce lactase. The latter problem is common for people from Asia. All people with food intolerance react to milk's proline-rich proteins called casein and beta-lactoglobulin if their gene is turned on. In Australia this is over 30 percent of the population.



People with food intolerance often go on a gluten-free and dairy-free diet, but this does not solve the problem. As stated above plants lay down proline-rich proteins to protect them against predators. People often tell me they only eat healthy vegetarian food and cannot understand why they still have food intolerance. The answer is simple: a vegetarian diet is not necessarily healthy for a person with food intolerance because many of the so-called healthy foods are rich in proline-rich proteins with structures even worse than gluten, for example carrot and beet root (see figure below). Special mention should be made of Spirulina which is hailed as a very healthy product but it has an exceptionally high level of proline.

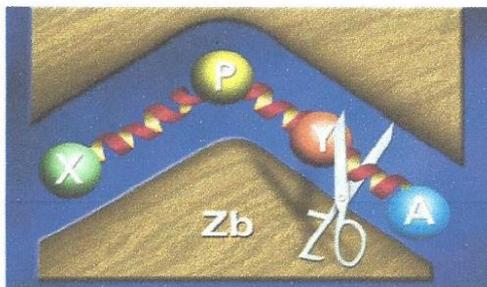
PROLINE-RICH PEPTIDES IN SOME FOOD AND DRINK PROTEINS

Wheat .. QPFPPQQPYQPQPFPSQLPY..	Barley .. PTPLPQQQFPQQPQQPLPRPQQP..
Milk .. QPTTMRHHPHLSFMAIPPK..	Wine .. CPSPSPKPKVKHPLPPLPKHPPH..
Carrot .. CPDPYKPKKPTPKPTPYPS..	Tomato .. CPYCPYPPSTPKHKLPPKVKPPS..
Onion .. NPGLRNPRFQNI PRDCRNTFVRP..	Lentil .. KPPVYKPPVEKPPVYKPPVVKPP..
Capsicum .. EPPKPKPEKPKPEKPKQPEKPK...	Grapefruit .. PPPEPKKPK..
Beetroot .. RPSRPTPPRPPTPRPPPRPPTPRP..	Asparagus .. CPHCPTTIPTHPPTTKPIDPPTHRPHPPK..
Soy .. PSHPPRRPS..	Peanut .. DPYSPDPYSPSQDPDRRDYSPSPY..
Coffee .. QPFRPPSPPLPPQ..	Chocolate .. NPYYFPK..

P proline **P** where ginger enzymes digest protein

The Biohawk Solution

The aim was to find a food that was rich in an enzyme that was designed by nature to specifically and efficiently digest only proline-rich peptides. A special blend of rhizomes from the ginger family was found to be able to do the job and digest proteins such as gluten and casein making it safe for people to eat bakery products made from wheat flour and to drink milk, and the hind gut was brought back to neutral within 3 days according to studies with race horses. A small amount of the Biohawk ginger was able to digest the proline-rich proteins in all these other foods.



The ginger enzymes are unique in their specificity and efficacy in digesting the proline peptides with a hydrophilic amino acid next to it. The cavity in the ginger enzymes which binds the protein resembles closely the HLA DQ2/8 gene cavity and is able to digest the protein one amino acid away from the proline. Only a bent protein at proline (P) can fit in the active site. This applies to all proline-rich proteins: food proteins, the membrane protein on viruses, bacteria, and cancer cells, and proline-rich toxins such as prion, the cause of mad cow disease.

The digestion of food proteins improves the nutrition of these foods substantially for all people and animals.

Foods that cause food intolerance include all cereal grains including chia, all legumes, all animal milk including human milk, many vegetables and fruits including their juices, coffee, chocolate, wine, whisky and beer. Asians ferment soy to overcome its problems. Eastern Mediterranean people condition their legume grains such as chick pea and lentils. The problem can be easily removed by



treating each of these with the Biohawk ginger products. See Helpful Hints for Food and Drink. The digestion of the milk casein means there is no longer a difference between a1 and a2 milk:

YPFPGPIH Beta casein a1 (bovine casomorphin 8 with BCM7 underlined)

YPFPGPIP Beta casein a2 (bovine casomorphin 8 with BCM7 underlined)

Casomorphin 8 is the only difference between a1 and a2 milk, and is the key peptide of concern. For both forms of milk, casomorphin is digested by Biohawk's ginger between F and P eliminating this problem casomorphin. The ginger digests the casein (and beta-lactoglobulin) much more extensively than at the casomorphin making the milk much more nutritious.

There is a very long list of symptoms of food intolerance. The most common are:

- Reflux & excess wind
- Gut pain
- Diarrhoea or Constipation
- Tiredness and chronic fatigue
- Fuzzy head
- Fat on women's bottoms, thighs & breasts
- Fat on men's 'stomachs'
- Allergies

Examples of autoimmune diseases that are caused by food intolerance:

A few percent of people with food intolerance have **Coeliac Disease** which causes significant damage to small intestine villi that are involved in the uptake of nutrients in the small intestine. The failure to take up nutrients means the people are usually very thin with no fat laid down as listed above. The alpha protein in the HLA gene is slightly different to that in other people with food intolerance and people with CD have a severe reaction to gluten as they utilise tissue Transglutaminase to deaminate some glutamines in the gluten proteins so they bind more strongly to the gene than for the other people with food intolerance. People with CD react to the other proline-rich foods and it is not sufficient to have a gluten-free diet.

Children with **Autism Spectrum Disorder (ASD)** as distinct from children without this condition have in their urine peptides from proline-rich proteins such as gluten and casein (see papers by Karl Reichelt). One of the theories for ASD is based on these types of peptides inflaming the brain. Children with ASD who take the Biohawk ginger preparation and only eat food where there are no proline-rich proteins or the proteins have been digested by the Biohawk ginger rapidly show major improvement. These preliminary results have led to a combination of groups who specialise in autism in Norway to undertake a formal clinical trial using the Biohawk ginger preparations.

Cancer genes are turned on by a hypersensitized immune system and food intolerance is one of the main causes of this condition. Cancer cells express on their membranes proteins that are proline-rich and which often have a high level of homology with food proline-rich proteins such as gluten. For example, a highly expressed protein from breast and other cancers is SATB1 which has over 50% homology with gluten proteins. The breast cancer androgen receptor has a similar structure. Interestingly the gene for Dementia with Lewy Bodies also is related. All are susceptible to digestion by the Biohawk ginger.

Homology of autoimmune disease proteins with wheat proteins

DLB	QQQQLPQQQQQQPPQ QPPQQPQQQDSVWGMNHSTLHSVF QTNQSNNOQSNFAVQ
SATB1	QQQQQQQQQQQAPPPPPQPPQQPQT GPRL PPR- QFT VASPAES DEENRQKTRPR
Gliadin	QQQQQQQQQQQQPLSQVVSFQQPQQQ YPSGQGSFQPSQQNPPAAGSVQPPQL PQ
LMWGlu	QQQQQQQQQQQQPPFSQ- QQQPVLPPQPPFSQQQQPPFSQ QQQPSSQ QPPFPQ
BCAndR	QQQQQQQQQQQQETSPPRQQQQQQGGEDGSPQAHRRGPTGYLVLDEEQQPSQPQ

DLB = Dementia with Lewy Bodies PARK11 gene
 SATB1 = over-expressed protein from breast cancer
 Gliadin = wheat protein
 LMWGlu = wheat protein
 BCAndR = Breast cancer androgen receptor

P = proline where ginger cleaves
Q = glutamine
S = serine



Eczema is a common autoimmune response to food. The digestion of the food proline-rich proteins can quickly control the problem:

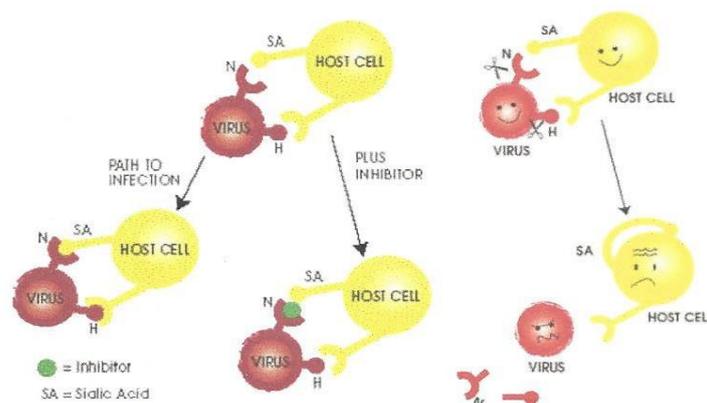
.SEVERE ECZEMA BEFORE AND AFTER DIGESTION OF FOOD PROLINE-RICH PROTEINS



Scientific studies have shown the link between food intolerance and many autoimmune conditions. A few of these are diabetes, rheumatism, Crohn's Disease, Schizophrenia, depression, epilepsy, Lupus, thyroid disorders, and multiple sclerosis. Treating the food intolerance can greatly assist in controlling the health condition.

VIRUS PROLINE-RICH PROTEINS

As mentioned above, proline-rich proteins are expressed on all virus membranes and are intimately involved in the reproduction of the virus in the host's cells. For example, the influenza virus has two types of proline-rich proteins on its membrane, hemagglutinin (H) and neuraminidase (N).



The influenza virus invades a host cell by initially binding to receptors on the host cell, one of which binds to the hemagglutinin (H) on the virus, and one with sialic acid (SA) which binds to the neuraminidase (N) protein on the virus. Current inhibitors for influenza virus are designed to mimic the sialic acid and to bind to the neuraminidase blocking the link to the host cell. The neuraminidase structure changes regularly and the inhibitor will not bind equally as well to the neuraminidase for each mutation of the virus. The Biohawk ginger product acts like pair of scissors and specifically cuts off the hemagglutinin and neuraminidase proteins from the surface of the virus completely preventing the virus infecting the cell and replicating itself.

The influenza virus mutates regularly changing the amino acids in the two membrane proteins, but the virus conserves the prolines to protect it against attack by other enzymes and to conserve structural elements in these receptors. To illustrate this a segment of the hemagglutinin protein is reproduced



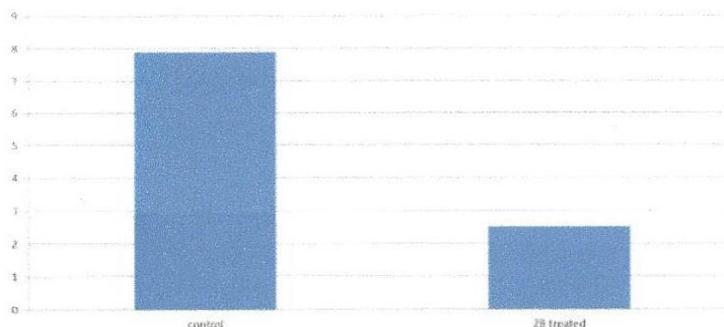
for a number of important influenza viruses. The yellow highlights where the ginger enzyme digests these Proline-containing segments. This conservation of the proline peptides is repeated throughout the proteins' structures. "Z" in the H5N1 denotes where the amino acid is not conserved but it is a hydrophilic amino acid in the three variants and allows the ginger enzyme to cut the protein there. The recent bird flu, H7N9, looks to be a primitive form because in the whole structure of these proteins it has many more variations than the others.

SEGMENT OF INFLUENZA HEMAGGLUTININ

bird flu H5N1 (3 variants)	VPZIATRPK
swine flu H1N1 (swine)	KPEIAERP
swine flu H1N1 (human 1991)	TPEIAERP
swine flu H1N1 (human 2009)	KPEIARPK
influenza A H1N1 (human 1918)	TPEIARPK
equine flu H3N8 (bird, human, horse)	IPNIGSRPW
bird flu H3N2	IPNIGSRPW
bird flu H9N7	KPVIGPRPL
bird flu H7N9	VPSPGARPK

The Biohawk ginger has been tested by a number of the leading virus laboratories in terms of its ability to inhibit viruses including the H5N1 bird flu. The result from one study is shown in the following figure:

**H5N1 AVIAN INFLUENZA ZB GINGER INHIBITION
INCUBATED EMBRYONATED CHICKEN EGG ASSAY
4 HR INCUBATION AT 37C WITH ZB AT 450U/mL**
log EID /mL
10 50



Papilloma virus shows a similar conservation in its prolyl peptide groups in its many variants of its membrane proteins. The most common variant's membrane protein structure is shown below with the yellow highlights identifying the peptides where the ginger enzyme can digest the protein:

PAPILLOMA VIRUS HPV2a

1 MALWRP NESKVYLPP.TPVSKVISTDVYVTRTNVYYHGGSSRLLTVGHPIYY
 51 SIKKSNNKVAVPKVSGYQYRVFHVKL PDPNKFGLPDADLYDPDTQRLLWA
 101 CVGVEVGRGQPLGVGVSGHPYYNRLDDTENAHTPDTADDGRENISM DYKQ
 151 TQLFILGCKPPIGEHWSKGTTCNGSSAAGDCPPLQFTNTTIEDGDMVETG
 201 FGALDFATLQSNKSDVPLDICTNTCKYPDYLKMAAEPYGDSMFFSLRREQ
 251 MFTRHFFNLGGKMGDTIPDELYIKSTSVPTPGSHVYTSTPSGSMVSSEQQ
 301 LFNKPYWLRRAQGHNNGMCGWGNRVFLTVVDTRSTNVSLCATEASDTNYK
 351 ATN FKEYLRHMEEYDLQFIFQLCKITLTPEIMAYIHNM DPQLLEDWNFGV
 401 PPPPS ASLQD TYRYLQSQAITCQKPTPPKPTDPYASLTFWDVDLSEFS
 451 MDLDQFP LGRKFLLRGAMPTVSRKRAAVSGTTPPTSKRKRVR



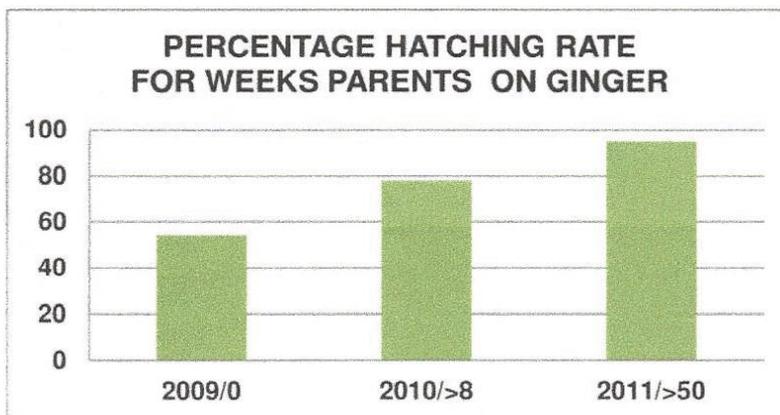
Active common warts are associated with this variant of the Papilloma virus. If the virus is killed, the wart is no longer able to grow. The following figure shows how quickly this can happen when the virus' membrane protein is digested by the ginger enzyme in a topical cream:

COMMON WART TREATED WITH ZB GINGER
3PM SUNDAY 9AM MONDAY



IMPACT OF FOOD INTOLERANCE ON FERTILIZATION

Experiments with about 20 varieties of chickens has shown that if the parents take the ginger enzyme in their water supply, the fertilization and hatching rates as a percentage of the eggs set increase markedly depending on the length of time the parents have access to the ginger:



For one variety, roosters who had not fertilized an egg for 3 seasons, after being on ginger for a year all had a 100% success rate. Good nutrition is probably required for good sperm.

Biohawk is keen to work with researchers who are interested in overcoming the effects of food intolerance in humans on successful reproduction. The hypersensitized immune system could well cause the loss of an embryo. Our observations suggest mares on feed that would cause food intolerance tend to "slip their foal". As the percentage of people at reproductive ages with food intolerance increases especially as the age of people who have had a successful vaccination program increases, there will be an increase in the number of couples who have problems with reproduction. Controlling the food intolerance may be a solution.

Conclusion



Cobb 308 chickens (day 29) identically housed and fed with chicken on left on ginger in water.

The chicken on the right which is the one you usually buy has diarrhoea, its bone and ligament structures have been distorted to the degree that it cannot stand for too long and exercise, it has not matured correctly, and it has much fat under its skin. Whereas the chicken on ginger has beautifully strong legs, no diarrhoea, minimal fat under the skin, well matured, good breast muscle (15% more for the same carcass weight), 17% greater carcass weight, no stress and enjoys exercising regularly.

WHICH CHICKEN DO YOU WANT TO BE?

**Clifford J Hawkins BSc PhD DSc
Biohawk**



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