

MD+ ReNew

Anti-Stress, Anti-Aging Formula



Combats physical and mental stress in all its forms.



ReNew is formulated to combat physical and mental stress. As such, it's useful for a variety of problems and situations including over-training and physical/mental burnout. It's also useful to combat the stresses of our environment and aging.

The ingredients in ReNew will help to reduce stress related abnormalities and dysfunction, including depression, normalize the metabolic processes in the body and support the central nervous, hormonal and immune systems.

ReNew plays an important role in increasing health and decreasing physical and mental stress, disease and the effects of aging.

www.MDRENEW.COM

Formulated by Mauro Di Pasquale, M.D.



Dr. Di Pasquale is an author, a former world champion, a former professor at the University of Toronto, and actively involved in the weight loss, sports and fitness fields for over four decades.

He is presently a licensed physician in Ontario, Canada, and for the last three decades has specialized in Bariatric Medicine (treatment of obesity), Sports Medicine, Anti-Aging and Nutrition.

Introduction

ReNew represents a new paradigm in nutritional supplements, one that is meant to deal with the underlying causes of stress, fatigue and burnout, both physical and mental, and to resulting problems.

That's because the ingredients in ReNew are meant to deal with inflammation and immune system problems that are secondary to almost everything negative that happens to the body.

With its evidence-based approach, meaning that there are valid scientific and medical reasons behind the use of each of the ingredients in ReNew, ReNew is a supplement that caters to everyone in our modern day society, a society that is exposed to more stressors than any other in the history of man.

Not only are we exposed to mental stressors, but also physical stressors, whether voluntary, in our expectations and driven personalities, or involuntary, such as environmental pollution.

ReNew is formulated to deal with all of these stressors and can be used in a reactive and/or proactive way. That's because it's effective in preventing some of the results of stress such as inflammation, and can also be used to deal with the already present effects of mental and physical stress.

While ReNew is meant for long term use, it can also be used for short term use in the event of an anticipated stressful event. In the latter case, administration can be started a few weeks prior to a period of expected increased physiological, chemical, or biological stress, and continued throughout the duration of the challenging event or activity.

**ReNew combats
physical and
mental stress
whatever the
cause.**



What Does ReNew Do?

ReNew is a research-driven, synergistic blend of natural ingredients with significant anti-stress, immune, anti-inflammatory, antioxidant, metabolic and anti-aging properties, including the following:

- Decreases stress induced anxiety and the effects of stress on the body, including depression.
- Decreases mental and physical symptoms of physical stress, including overtraining.
- Maximizes mitochondrial function.
- Enhances recovery from training and has adaptogenic properties.
- Enhance vitality, strength and stamina.
- Increases nutrient delivery to stressed tissues.

- Decreases inflammation and levels of pro-inflammatory cytokines.
- Decreases homocysteine levels.
- Organ and tissue protectant and also increases regeneration and repair.
- Increases cardiovascular health.
- Neuroprotective - decreases neuronal stress and damage.
- Increases memory and mental function.
- Protects the liver (Hepatoprotective).
- Strengthens the immune system.
- Provides antimicrobial defences.
- Decreases effects of aging and other catabolic influences on the body, including deterioration of the brain, musculoskeletal system, and the skin.
- Protective against harmful effects of heavy metals, including mercury, and other chemical contaminants. pollutants and chemicals in our food and water supply, decreasing their effects on the body including pesticides, cell and DNA damage.

- Has nutrient partitioning effects and thus improves body composition.
- Decreases body fat, including fat around the waist.
- Increases insulin sensitivity.

As you can see, ReNew has significant beneficial effects on metabolism and energy, and various systems in the body including the immune, central nervous, musculoskeletal, cardiovascular, gastrointestinal, hormonal, and genitourinary systems. It also helps to counter the harmful effects of environmental pollution including heavy metals such as mercury.

The overall effect of ReNew is to counteract the influence of many factors that contribute to mental and physical problems and aging.

Stress, a Fact of Life

For many reasons, including our hectic lifestyles, exposure to world events, and pollution, we're more stressed out than we've ever been.

But stress is a fact of life and we all learn to deal with it. However it's not innocuous. If it's chronic it can rob us both physically and mentally.

We're all familiar with psychological stress and what it can do to us. Working too hard for too long, relationship problems that won't resolve, crushing financial problems, a string of tragedies that we just can't seem to recover from, etc.

And we all know that this kind of chronic emotional stress can bring us down, causing irritability, fatigue, depression, difficulty sleeping, sickness and the rest of the stress syndrome.

And then there's physical stress. Even though this form of stress isn't caused by factors that stress out many people today, it's common among athletes who take their training seriously, and among those of us who still think we're athletes and overdo it. In both cases it's really a matter of the old adage "if some is good then more is better" gone wrong.

But it's not just emotional and physical stress that can cause the downward stress spiral. We're also stressed out by our deteriorating environment and even some of the foods we eat, including processed and fast foods.

But whatever the cause chronic stress can impact on the body in several ways, leading to metabolic, hormonal, immune and central nervous system dysfunction, an increased susceptibility to disease, and a decrease in our quality of life.

It's important, however, to realize that while it may be difficult to control our stressors, we can modify our response to stress. There's not much that we can do to control world events, pollution, the spread of illnesses, especially viruses, and ups and downs in our lives that are due to other people and events. But there is something we can do on how we react to stress and successfully adapt to maintain our well being and quality of life.

There are several ways we can and should respond to stress such as keeping a proper perspective on things you can and should deal with and things that you're simply obsessing on. It helps to exercise, eat right, and try to keep healthy work, sleep and leisure habits. And it also helps to take the right supplements.

ReNew is specifically designed to assist the body in overcoming a vast array of physiological and psychological stressors and to help avert the effects of aging and illness.

It contains a number of adaptogens, biological substances found in certain plants and herbs that help the body adapt to stressors of various kinds, whether physical exertion, trauma, infection, sleep deprivation, or psychological stress.

Several ingredients in ReNew are standardized extracts of highly valued adaptogens that provide overall stress protection, increased energy, more restful sleep, enhanced recovery and cognitive benefits. For example **panax ginseng** contains ginsenosides, which stimulate the immune system, fight fatigue and stress and optimize muscle metabolism.

Adaptogens in ReNew include **panax ginseng**, **rhodiola root (rhodiola rosea)**, **holy basil leaf (Ocimum sanctum)**, **schisandra chinensis** and **ashwagandha root (Withania somnifera)**.

Besides the adaptogens, there are many other ingredients in ReNew that improve well being. For example in a study involving 80 young, healthy males, the use of **calcium**, **magnesium** and **zinc** was associated with reduced anxiety and perceived stress, and an improved feeling of well-being.¹

As well, ReNew when used long term acts as a form of insurance for later in life. So while you may not see the short term effects of some of the ingredients in ReNew you'll see the beneficial effects down the road.

For example, fish oils (DHA and EPA) may not have a noticeable effect on your body now, but may protect you from cardiovascular disease later in life. Vitamin C, calcium, magnesium, and manganese supplementation used today may diminish the effects of osteoporosis and fractures when you're older.



ReNew as a Form of Preventative Medicine

Much of our society, and this is especially true of medicine, is based on dealing with crises. Doctors are schooled in treating disease through a variety of established means, involving mostly drugs and surgery to deal with health disasters, whether big or small, whether warts or cancer. But while our knowledge of dealing with disease is advancing rapidly, not enough is being done to prevent the crisis from occurring in the first place. And not enough is being done to deal with disease, whether physical, mental or emotional, in ways that are less destructive and more helpful than the approach that traditional medicine now offers.

This societal mind set applies not only to medicine but to other elements in our lives. The problem is that the things that fester underneath and go bump in the night are not dealt with until it's almost too late. Often not until the crises have destroyed our peace of mind, our health and our productivity.

But it doesn't have to be this way. We can take a proactive stance rather than merely a reactive one. We can deal with the issues before they coalesce into crises. And we can do this by dealing with all of the potential problems that can impact on our overall wellness, not just the physical, but also the spiritual, mental, and emotional elements that can rob us of our energy and productivity. And then doing something about them that involves more than just waiting for the crisis to appear and then doing a patch job.

This is what ReNew is also about. Sure it's useful for dealing with situations that have already coalesced into problems. But it's also good at intercepting situations before they become problems.

Let's take elevated levels of homocysteine for example. It's been shown, and we'll detail it all below, that elevated levels of homocysteine can cause all kinds of problems, from cardiovascular disease to cognitive dysfunction. Since it's not all that hard to decrease elevated homocysteine levels, sometimes simply by taking in adequate amounts of folate and B12, it's something that we can do to protect our health as we age.

If we apply this preventative mindset to our present and future health, then ReNew becomes part of our solution to increasing health, decreasing disease, and decreasing the effects of aging.

Antimicrobial Effects- Immune System Neutralizing Bacteria



History of ReNew

Over the years I've been concerned about the effects of physical and mental stress on our bodies, lives and longevity. I've researched the topic extensively over the past few decades and used the information to formulate my line of supplements. However, of all the supplements I've worked on, ReNew has been my biggest hurdle. I wanted ReNew to strike at the heart of mental and physical stress and its effects on the body and mind. In order to do this I had to figure out what metabolic pathways were involved in producing the negative effects.

I finally came out with ReNew, a supplement that's not smoke and mirrors, as are many of the supplements on the market today, and a supplement that is multi-dimensional instead of the one dimensional products on the market today. All of my knowledge and research has finally come to fruition in ReNew, which represents a new generation of supplements incorporating the latest in anti-stress knowledge and technology.

The dozens of ingredients in ReNew work synergistically and systematically to produce an entirely new level of effectiveness never before seen in the supplement industry. In fact, it is the first product ever to look at all aspects of various stressors in our lives and contains dozens of ingredients that work synergistically to alleviate the mental and physical effects that stress has on the body.

The individual ingredients and the synergy of ingredients in this evidence-based, research-driven formula have been proven to affect your metabolism to produce unprecedented stress relief without causing any negative health effects.

ReNew is the culmination of my four decades of research on this front and is a true breakthrough that is unequalled in its ability to attack stress at several levels and bring the fastest possible results.

Inflammation, Pro-Inflammatory Cytokines, Insulin Resistance and Cortisol

One of the biggest changes in this new version of ReNew is the emphasis on the **pro-inflammatory cytokines**, a subject that is increasingly preoccupying researchers to the point that today they're one of the hottest research topics.²

Pro-inflammatory cytokines (markers and regulators of inflammation) have been implicated in physical and mental stress, aging, the metabolic syndrome, diabetes, obesity, visceral body fat (fat around the belly), and a variety of cardiovascular and other diseases. As such, they're becoming increasingly important when it comes to dealing with the human condition, including the effects of chronic stress, many diseases, the accumulation of body fat and quality and length of life itself.

Because this concept is so new and revolutionary, I cover it in much more detail later on. For now it's important to realize that ReNew is formulated to help us decrease the counter productive effects of the pro-inflammatory cytokines on our health and longevity.

There are many ingredients in ReNew that target inflammation and in particular the pro-inflammatory cytokines including **L-carnitine, vitamins B6, B12, folic acid, betaine, calcium, magnesium, curcumin, burdock,³ quercetin, alpha lipoic acid, DHA and EPA, kelp and various antioxidants such as beta-carotene, vitamin C, vitamin E, selenium, silymarin, glutathione, n-acetyl cysteine, L-cysteine, coenzyme Q10, etc.**

L-carnitine (LCAR) is considered by many to be essential nutrient with critical roles in energy metabolism. Several studies have shown that LCAR decreases the production of some of the pro-inflammatory cytokines and has anti-inflammatory and immunomodulating effects.⁴⁵

In a recent study the authors concluded that the use of L-carnitine can improve cellular defense against chronic inflammation and oxidative stress, most likely by modulating the specific signal transduction cascade activated by an overproduction of pro-inflammatory cytokines and oxidative stress.⁶

Curcumin, which comes from the spice turmeric (**curcuma longa**), is documented to have many beneficial properties including anti-cancer, anti-inflammatory and antioxidant effects.⁷ As an antioxidant, curcumin reduces the activity of certain enzymes, inhibiting all branches of the arachidonic acid cascade, and reduces pro-inflammatory cytokine synthesis.⁸

The rhizome of this plant has been traditionally used as an anti-inflammatory agent in Ayurvedic medicine. In a double-blinded trial, post surgical patients receiving curcumin experienced reductions in stiffness and joint swelling comparable to the effects of phenylbutazone, a potent anti-inflammatory drug.⁹

Of all the spices and herbal preparations it seems that only the spice turmeric has any anti-inflammatory effects. This was the conclusion of a study of a variety of Ayurvedic and herbal preparations, which was presented recently at the 9th Asia Pacific League of Associations for Rheumatology Congress. In this study, a variety of herbal and Ayurvedic preparations were tested in rats. The rats were fed oral doses of the varied herbal and Ayurvedic recipes. Only turmeric showed anti-inflammatory effects when tested on irritated paws of the rats.

The bioflavonoid **quercetin** has been shown to have significant anti-inflammatory activity in cases of both acute and chronic inflammation¹⁰¹¹ and protective effects against the pro-inflammatory cytokines.¹²¹³ As well, several inflammation-promoting pathways are known to be inhibited by quercetin. For example quercetin is known to have antioxidative and antihistaminic effects.¹⁴¹⁵ A recent study found that quercetin showed an increase in activity when combined with vitamin C.¹⁶ Interestingly enough the same study found that the in vitro antioxidant activity of quercetin was better than vitamin C. Quercetin has also been shown to have antimicrobial properties.¹⁷

Echinacea has been shown to have antioxidant, immune stimulant, and antimicrobial properties and is commonly used for enhancing the immune system and for treating and preventing infections.¹⁸¹⁹²⁰

As well, ReNew contains ingredients to decrease inappropriate increases in cortisol and thus augment the decrease in the pro-inflammatory cytokines. These ingredients decrease the factors responsible for both excess body fat and increased cortisol.

For example **beta sitosterol**, used mainly for people with prostate problems,²¹ also has immune system, cortisol controlling and anti-inflammatory effects.²² In one study a mixture of beta sitosterols were tested on marathon runners. The supplemented group, but not the placebo group, showed increased immune cell numbers, decreased inflammation, and decreased cortisol levels.²³

Alpha lipoic acid (ALA), a potent antioxidant²⁴²⁵²⁶ that can recycle other antioxidants such as vitamin C, vitamin E and glutathione (Packer et al. 1997).²⁷²⁸ ALA was added to ReNew III to increase insulin functioning and sensitivity²⁹³⁰ and for its actions on the pro-inflammatory cytokines³¹³² and on secondary cortisol elevations. Interestingly enough a combination of ALA and CLA, also in ReNew, had a synergistic effect on increasing insulin sensitivity.³³

A recent review on ALA³⁴ concluded that “LA improves glycemic control, polyneuropathies associated with diabetes mellitus, and effectively mitigates toxicities associated with heavy metal poisoning. As an antioxidant, LA directly terminates free radicals, chelates transition metal ions (e.g. iron and copper), increases cytosolic glutathione and vitamin C levels and prevents toxicities associated with their loss.”

ALA works with several other ingredients in ReNew such as **chromium, zinc, biotin, magnesium** and **beta carotene** and all the ingredients that decrease inflammation and the levels of some of the pro-inflammatory cytokines, to increase insulin sensitivity, decrease blood glucose levels and decrease destructive glycation end products (AGEs).

Chromium enhances insulin sensitivity and decreases insulin resistance.³⁵³⁶ As such, it can be used as an aid to treat various conditions associated with insulin resistance including the metabolic syndrome, diabetes, glycation and cardiovascular disease.

For example, a recent study found that a combination of chromium and fish oil (both in ReNew) increased insulin and leptin sensitivity.³⁷

Although most diets just barely provide the RDA for chromium, for many it's not enough to make up for daily losses, especially if they exercise. With ReNew you get another 100 mcg per day per dose so that you'll be sure to have an optimal amount of chromium for maximizing insulin sensitivity.

But not any kind of chromium is OK. For example the most commonly used form of chromium, chromium picolinate, has potential adverse effects associated with its use.³⁸ The polynicotinate form of chromium used in ReNew is a readily absorbable and biologically active form of chromium that enhances insulin sensitivity, without side effects.

Rhodiola rosea has been categorized as an adaptogen due to its observed ability to increase resistance to a variety of chemical, biological, psychological and physical stressors.³⁹⁴⁰ It has significant effects on dampening the adverse hormonal effects of stress, including cortisol, insulin and thyroid, and in enhancing adaptation to stress.⁴¹ It also has potent antioxidant, anti-inflammatory, cytoprotective, hepatoprotective and cardiovascular effects.⁴²⁴³⁴⁴⁴⁵⁴⁶⁴⁷ As well, it has been shown to be useful in decreasing stress induced fatigue and increasing endurance.⁴⁸⁴⁹⁵⁰

Coenzyme Q10 (CoQ10) is a lipid-soluble antioxidant and a key component of the mitochondrial electron transport chain for adenosine triphosphate (ATP) production.⁵¹ Myocardial CoQ10 content is reduced by cardiac failure and aging. It is also reduced by the popular cholesterol lowering drugs⁵² and preventative supplementation of coenzyme Q10 while on these drugs is likely a good idea.⁵³

A recent study found that ongoing coenzyme Q10 supplementation had significant anti-aging effects.⁵⁴ In this study mice supplemented with CoQ10 looked and behaved better than ones that hadn't. The authors concluded that supplementation with reduced CoQ10 decreased the degree of senescence in middle-aged SAMP1 mice.

Besides the ground breaking effects that ReNew has on the pro-inflammatory cytokines, and on insulin sensitivity and inappropriate cortisol production, it has a host of other ingredients that together make ReNew the premier anti-stress and anti-aging supplement.

Antioxidants

Antioxidants form a front line defense against cell damage caused by free radicals, which are involved in damage to all systems in the body and in the aging process. As well, the antioxidants, immune stimulant, and other ingredients in ReNew, normalize and optimize the immune system to help deal with various problems and diseases. They are also effective in combating inflammation, free radicals, and other destructive processes that which are known to contribute towards aging and disease.

One of the most effective means of protecting ourselves from various endogenous and exogenous insults (including stress, free radicals, poor diet, and environmental chemicals and pollutants, including mercury and other heavy metals) is by using a complimentary combination of antioxidants.

In a recently published review the author found that antioxidant vitamin and trace element intakes have been shown to be particularly important in the prevention of cancer, cardiovascular diseases, age related ocular diseases and in aging. In animal models, targeted interventions have been associated with reduction of tissue destruction in brain and myocardium ischemia-reperfusion models. In the critically ill antioxidant supplements have resulted in reduction of organ failure and of infectious complications.⁵⁵

Antioxidants, such as **beta carotene, vitamin C, vitamin E, selenium, zinc, reduced glutathione, N-acetyl cysteine (NAC), L-Cysteine, Coenzyme Q10, alpha lipoic acid, ginkgo biloba, burdock, silymarin, and turmeric**, all present in ReNew, can play an important role in reducing inflammation, and decreasing tissue and organ damage.

For example, various antioxidants, such as **vitamin E**, have been found to be useful in the treatment of some forms of arthritis⁵⁶ and in dealing with the oxidative stress of exercise.⁵⁷ As well, oxidative damage has been shown to contribute to the pathogenesis of various disease, and the use of antioxidants, such as NAC,⁵⁸ shown to have therapeutic value for a number of inflammatory and other conditions.

Beta carotene has immune stimulating properties that are not found in vitamin A, for it actually enhances the proliferation of T and B lymphocytes and the production of macrophages and interleukins, and has natural killer cell tumoricidal abilities. Beta carotene is the preferred form of vitamin A because it is non-toxic and provides greater protection against cancer and is an antioxidant which attributes to its anti-cancer activity.

Vitamin C is essential to the body as both an antioxidant and as a nutritional supplement. As a free radical scavenger, vitamin C is considered by some to be the body's most important antioxidant. It can improve the immune system, prevent the formation of blood clots, improve lung function, speed the healing of wounds and help in the prevention of cancer. Studies have shown that vitamin C protects cellular structures from the effects of oxidation.

Vitamin C works synergistically with vitamin E and can regenerate vitamin E. It also has a synergistic and reciprocal relationship with glutathione: ascorbate spares glutathione and increases mitochondrial glutathione in glutathione deficient animals. Glutathione and vitamin C also work together in protecting mitochondria from oxidative damage.⁵⁹

Vitamin E is one of the most potent of antioxidants and protects fats from free radical destruction (lipid peroxidation or rancidity) throughout the body. It also is useful in helping protect the body from carcinogens, heavy metals, and industrial chemicals; improves immune function.

Selenium (L-Selenomethionine) significantly enhances the activity of vitamin E and is an essential component of glutathione peroxidase, one of the body's most important antioxidant enzymes. In addition, selenium has been shown to have the properties needed to stimulate the immune system; protect the body against peroxide metabolites, radiation and free radicals; detoxify the body of environmental carcinogens; and protect the liver.

Selenium deficiency has been associated with AIDS, cancer, arthritis, Crohn's disease, anemia, MS, asthma, and low sperm counts, as well as other diseases and conditions. Selenium has the ability to buffer heavy metals and to offer some protection against the side effects of some chemotherapeutic drugs.⁶⁰

Glutathione is one of the most important endogenous antioxidants. In a recent study on GSH and aging, it was found that GSH concentrations are positively correlated with age and good health. ReNew contains not only reduced glutathione but also the essential supportive components of glutathione activity - **Selenium, L-Cysteine, Coenzyme Q10, and Beta-carotene**.

Alpha lipoic acid (ALA), because it is a sulphur compound, can bind and help eliminate heavy metals such as copper, iron, mercury and cadmium, all of which can cause oxidant damage to the body and thus affect functioning. Burdock is felt to have similar effects and works well with Lipoic Acid.

Alpha lipoic acid (ALA) has a double antioxidant effect as it has significant antioxidant properties on its own, but also regenerates glutathione, the most important endogenous antioxidant. ALA and glutathione have been shown to have significant effects in decreasing mercury toxicity in the body.⁶¹

ReNew contains several ingredients that lower the mercury load and decrease the toxic effects that mercury has on the body. These include the antioxidants **alpha-lipoic acid, glutathione, N-acetyl-cysteine, cilantro, vitamin C and E, zinc** and **selenium**.

N-acetyl cysteine (NAC), an altered form of the amino acid cysteine, also helps produce glutathione and has antioxidant properties on its own.

Carnosine, a dipeptide made up of the amino acids alanine and histidine (histidyl-alanine) was added to ReNew because of its many beneficial effects. It has been shown to have significant antioxidant properties, increase recovery and healing, provide a

buffering effect, enhance the immune system, provide anti-aging effects, and enhance the benefits of exercise by increasing increasing muscular contraction and blood flow, and decreasing fatigue.⁶²⁶³⁶⁴⁶⁵⁶⁶⁶⁷

Magnesium is also a crucial mineral for healthy response to stress (see below). Magnesium is a co-factor for copper/zinc superoxide dismutase (one of the body's natural the body's natural antioxidant enzymes), in addition to approximately 300 other enzyme types in the body. It is also necessary to activate thiamin (vitamin B-1) and pyridoxine (vitamin B-6) which enhances entry of magnesium into cells.

Silymarin, a component of milk thistle, is a flavonoid complex that has been shown to have significant antioxidant, antiinflammatory and anti-fibrogenic effects.⁶⁸ Studies have shown that silymarin is useful for dealing with various liver disorders including alcohol-induced liver disease, chronic hepatitis, and liver damage as a result of environmental toxins.⁶⁹⁷⁰

Glutathione, as we've mentioned, plays a specific role in a number of the body's metabolic processes. The compound is synthesized in the liver and intestine and by binding to toxic metabolites (both reactive and naturally occurring) protects the liver from damage.

Vitamin E and **selenium** compounds seem to have some hepatoprotective effects. In one study done on rats vitamin E, sodium selenite and Astragalus L. infusion used separately lowered the toxic effect of tetracycline on the liver, while the use of vitamin E in combination with sodium **selenite** or **Astragalus** L. infusion prevented such an effect of the antibiotic⁷¹. As well, **curcumin**, **alpha lipoic acid**, and **L-cysteine**.may aid in protecting the liver.

Synergistic effects of antioxidants

Studies have shown that antioxidants, while uniquely different from one another, have a synergistic effect when used together. By combining these various lipid- and water-soluble nutrients, ReNew offers multiple levels of synergistic protection.

Various inflammatory diseases are helped by the use of combinations of antioxidants. For example, asthma, and particularly exercise-induced asthma, in which exercise increases oxidative stress, impacts further on the preexisting oxidative and inflammatory phenotype of those prone to asthma, have been shown to respond favorably to a number of antioxidants.

Acute episodes of asthma, regardless of cause, are associated with increased oxidative stress,⁷²⁷³ and have been shown to respond favorably to **alpha-lipoic acid, vitamins C and E, and selenium**, as well as several other anti-inflammatory ingredients in ReNew such as **DHA and EPA**.⁷⁴⁷⁵⁷⁶⁷⁷⁷⁸⁷⁹⁸⁰

Several studies have also shown the synergistic effects of specific combinations of antioxidants. For example, a recent study has found that vitamin E and vitamin C protect the testes from damage secondary to oxidant damage.⁸¹

Alpha lipoic (thioctic) acid is synergistic with vitamins C and E, and they work together as a team to produce an antioxidant effect that is far greater than any one individual antioxidant.

Vitamin E and selenium interact to provide strong protection against oxidative damage to the liver.

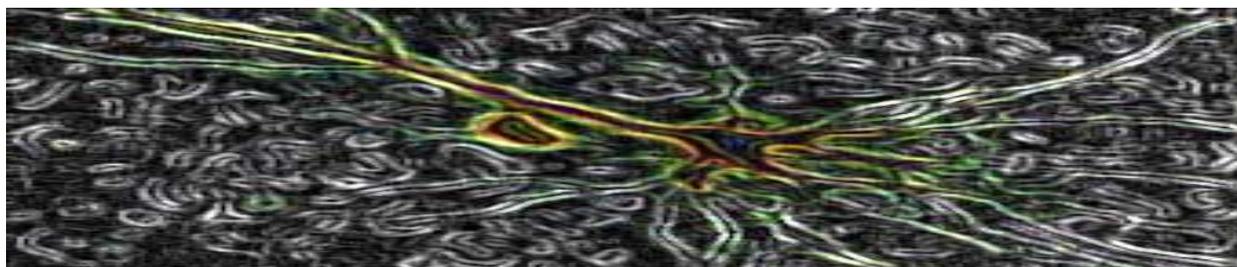
Selenium interacts with glutathione (GSH), which is a vital component in the production of glutathione peroxidase, an enzyme which is essential for life.

Both vitamin C and coenzyme Q10 interact with vitamin E to regenerate its antioxidant form.

Vitamin E and CoQ10 taken together are believed to have an interactive effect wherein CoQ10 has a sparing effect on vitamin E, and vitamin E plays a key role in determining tissue retention of exogenous CoQ10.

As mentioned above, a recent study found that quercetin showed an increase in activity when combined with vitamin C.

Improving Mind and Mood



Many nutrients impact on our mood, mental focus, memory and cognition. Many of these are in ReNew including those that beneficially influence brain function and have neuroprotective and cognitive effects.

ReNew contains several ingredients that affect brain and neurotransmitter functions such as **DMAE**, **L-tyrosine**, **mucuna pruriens**, **huperzine A**, **EPA**, **DHA**, **selenium**, **rhodiola rosea**, **ginkgo biloba**, **quercetin**, **astragalus**, **ashwagandha**, **choline**, **curcumin**, **alpha lipoic acid**, **vitamin E**, **vitamin B2**, **vitamin B3 in the form of niacinamide and vitamin B12** (there's a 1000 mcg of methylcobalamin, the metabolically active form of B12, in ReNew – much more than in any other poly ingredient nutritional supplement on the market).⁸²⁸³⁸⁴⁸⁵⁸⁶⁸⁷⁸⁸

DMAE, for example, has been shown to induce a psychophysiological state of better feeling of wellbeing on both levels of analysis mood and electrical pattern of brain activity in subjects suffering from borderline emotional disturbance.⁸⁹

Elevated levels of homocysteine have been shown to impact on cognition and mental acuity.⁹⁰ I've covered the details and how to deal with elevated homocysteine levels below. However, for now it's important to know that ReNew effectively deals with elevated homocysteine levels.

For example, there is now substantial evidence of a common decrease in serum/red blood cell folate, serum vitamin B12 and an increase in plasma homocysteine in depression.

In a recently published paper the authors concluded that “On the basis of current data, we suggest that oral doses of both **foliac acid** (800 µg daily) and **vitamin B12** (1 mg daily) should be tried to improve treatment outcome in depression.”⁹¹ **These are exactly the amounts of folate and B12 present in ReNew.**

Selenium is part of the ingredient mix as it's been shown to affect mood, anxiety, and tiredness levels.⁹²⁹³ When researchers confined a group of men to a research laboratory for four months and fed them high or low selenium diets, they discovered that low selenium levels led to depressed moods and other mind-altering effects.⁹⁴

Quercetin has been shown to have significant cognitive and anti-aging effects.⁹⁵ This study looked at the effects of quercetin on an animal model for cognition dysfunction

and found that chronic quercetin treatment reverses cognitive deficits in aged and ethanol-intoxicated mice, which the author attributed to its potent antioxidant property.

Ginkgo has beneficial effects on the brain due to its antioxidant ability, as well as its effects on circulation. In patients with dementia due to mainly cerebral insufficiency ginkgo produce positive results - patients taking ginkgo reported enhanced memory, better ability to concentrate, less confusion, more energy, and an overall mood lifting effect.⁹⁶⁹⁷

A recent study has shown the memory enhancing effects of a **Ginkgo biloba/Panax ginseng** combination in healthy middle-aged volunteers. In this study the use of both by healthy middle aged volunteers resulted in significant improvements in memory.⁹⁸

Researchers have long noted associations between depression, diabetes and heart disease. For example, people with major depression have been found to have higher rates of insulin resistance, a precursor to diabetes.

As such, there has been speculation that insulin resistance might be behind the symptoms of overeating, carbohydrate craving and weight gain seen in some people with depression.

A recent study found that **chromium** supplements may be useful for treating depression.⁹⁹ In this study, the use of chromium resulted in an improvement in hunger, overeating, carb craving and daily mood changes.

ReNew enhances energy levels, promotes mental concentration and alertness, and helps maintain healthy moods. All of this increases mental functioning and psychological health.



ReNew and Energy Metabolism

Among other reasons, I formulated ReNew to increase the efficiency of the Krebs's/TCA/Citric Acid Cycle as far as optimizing energy metabolism. There are ingredients in ReNew, including **L-Arginine Alpha Ketoglutarate, potassium succinate**, which will increase both glycolytic and Tricarboxylic Acid Cycle (TCA cycle, Krebs's Cycle) flux and thus increase the availability of ATP both aerobically and anaerobically. The result is increased energy and drive.

ReNew also contains the following nutrients to facilitate the glycolytic and TCA cycle energy processes:

- **Biotin** - a cofactor in many energy reactions involving glycogenolytic, glycolytic, TCA and anapleurotic enzymes.
- **Magnesium** - which has also been shown to increase energy systems, insulin sensitivity, protein synthesis and serum testosterone, GH and IGF-I levels.
- **Calcium** - which has been shown to facilitate muscle contraction and decreasing fatigue).
- **Potassium**, the transport of which is linked to aerobic glycolysis.
- **Coenzyme Q10** - a critical rate-limiting factor in the production of ATP.

As well, ReNew contains several ingredients that keep the functional and structural integrity of mitochondria intact. These cellular structures are the powerhouse of our cells and their functioning is crucial for our health and energy.

Mitochondria are exposed to high levels of oxidant stress (i.e. free radical damage) during cellular respiration. Free radicals, normal byproducts of mitochondrial function, are damaging when produced in excessive amounts and not neutralized by antioxidants. Mitochondrial function is also further affected by stress, aging and disease.

Repletion with specific nutrients necessary to support ATP production and antioxidant protection appears to reverse many age- and disease-associated deficits in mitochondrial function. The ingredients in ReNew that improve mitochondrial function include:

Coenzyme Q10 is one of the key antioxidant nutrients that protect mitochondrial membrane lipids and proteins and mitochondrial DNA from free radical-induced oxidative damage. It also regenerates and extends the action of vitamin E thus further protecting against membrane lipid peroxidation. Under the various forms of stress and inflammation, demand for coenzyme Q10 increases which must be met by dietary intake in order to optimize mitochondrial function.

L-Carnitine. This multifunctional nutrient facilitates the transport of fatty acids into mitochondria where they are oxidized, thus providing a major source of energy for the heart, brain, and skeletal muscle. LCAR also stimulates the synthesis of cardiolipin which plays a crucial role in mitochondrial membrane structure and function. Cardiolipin plays a pivotal role in maintaining mitochondrial proton gradients, permeability of inner

mitochondrial membrane to small molecules, and activity of mitochondrial membrane translocase proteins. Cardiolipin content declines with age and oxidative stress.

Alpha-Lipoic Acid. Alpha-lipoic acid is a required coenzyme involved in the energy metabolism of proteins, carbohydrates, and fats. It is also a potent antioxidant that neutralizes free radicals generated both inside and outside of membranes. In addition to its direct antioxidant activity, alpha-lipoic acid helps recycle vitamins C and E and stimulates the synthesis of glutathione.

Vitamin C and Vitamin E. Vitamin C is a critical part of the glutathione/alpha-lipoic acid antioxidant pathway. Vitamin E protects against mitochondrial membrane lipid peroxidation, thereby preserving membrane stability and function.

N-Acetyl-L-Cysteine (NAC). NAC is a nutrient precursor to glutathione and is effective at raising intracellular glutathione levels. Like alpha-lipoic acid, glutathione is an important antioxidant protector of mitochondrial membranes.

Vitamin B2 (Riboflavin), and Niacinamide. stimulate the synthesis of NADH, FAD, and NAD respectively which play key roles in the functioning of the citric acid cycle.

Schizandra chinensis is a woody vine with clusters of red berries that is found in northern and northeastern China and adjacent regions in Russia and Korea. It is used to treat a variety of medical conditions and is widely known as a longevity herb and aphrodisiac. Athletes have used schisandra in the belief that it will increase endurance and combat fatigue under physical stress.¹⁰⁰ It is also felt to have liver protective effects.

Folic Acid, Methylcobalamin (Vitamin B12) and Pyridoxine (Vitamin B6)

ReNew contains high doses of **Folic acid, Vitamin B6** and **methylcobalamin**, the biologically active form of **B12** (not the cyanocobalamin, the synthetic and not as metabolically active form of B12 that is generally used – see below), increases energy and health. These ingredients optimize macronutrient metabolism and help maximize muscle mass and decrease body fat. As well, they decrease serum levels of homocysteine, cholesterol and C-Reactive proteins, markers of heart disease and inflammation in the body.

The use of methylcobalamin instead of cyanocobalamin in ReNew warrants some mention.

Vitamin B12 in the methylcobalamin form is used in ReNew as it is the biologically active form of B12, whereas cyanocobalamin, the one used in most nutritional supplements, is the synthetic, and much cheaper form. The body has to change the cyanocobalamin into methylcobalamin. This process may be compromised in some people so using the metabolically active form is more efficient and improves

bioavailability and function. In fact several studies have shown the advantages of methylcobalamin over cyanocobalamin.

For example, a preliminary study investigated the effects of methyl- and cyanocobalamin on circadian rhythms, well-being, alertness, and concentration in healthy subjects.¹⁰¹ Six women (mean age 35 years) and 14 men (mean age 37 years) were randomly assigned to treatment for 14 days with either cyano-or methylcobalamin and found that levels of B12 increased linearly with the methylcobalamin but not with cyanocobalamin, and that only methylcobalamin had a positive psychotropic alerting effect with significantly reduced sleep time, improved sleep quality, concentration, and feeling refreshed.

As well, a recent review commented on the effect of B12 as an anti-cancer agent. In this paper the authors state:

“Vitamin B-12 has not been proven to be an anti-cancer agent, but there is some evidence indicating that it could be beneficial. The form of administered vitamin B-12 may be important.

Some experimental cancer studies have been carried out with various forms of vitamin B-12. Methylcobalamin inhibited tumor growth of SC-3 injected into mice [111], and caused SC-3 mouse mammary tumor cells to undergo apoptosis, even when stimulated to grow by the presence of growth-inducing androgen [112]. Methylcobalamin, but not cyanocobalamin, increased the survival time of mice bearing implanted leukemia tumor cells [113]. 5'-deoxyadenosylcobalamin and methylcobalamin, but not cyanocobalamin, were shown to be effective cytotoxic agents [114]. Methylcobalamin also was able to increase survival time and reduce tumor growth in laboratory mice [115].”

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There is so much to say about the effects that this trio (B12, folate and B6) has on metabolism, macronutrient metabolism, energy systems, and on combating the adverse effects of pollution and mercury toxicity, that it would take a separate book to document it all.

The health effects of all three of these B vitamins, the high prevalence of deficiency and effects of supplementation of all three, especially in the elderly, have been extensively documented.¹⁰²¹⁰³¹⁰⁴¹⁰⁵ These studies have shown that several of the medical parameters, such as homocysteine, cholesterol and C-reactive protein, markers of heart disease and inflammation in the body, are decreased by the use of hefty doses of these vitamins, and by some of the other ingredients in ReNew, including **betaine** (trimethylglycine – three methyl groups attached to the amino acid glycine) and **dimethylglycine**.

ReNew Lowers Homocysteine Levels

Methyl donors are important for the methylation reaction, which adds a methyl group (one carbon atom and three hydrogen atoms), on proteins, enzymes, chemicals, DNA, and amino acids like homocysteine. Methylation is important for maintaining many functions in the body including genetic expression, and neurological and musculoskeletal function.

ReNew contains a number of ingredients involved in methylation, including **vitamin B12** (as **methylcobalamin** – see above as to why the biologically active form of B12 is superior to the much more common, and cheaper synthetic B12, cyanocobalamin), **folic acid**, **B6**, **betaine**, **dimethylglycine** and **choline**. These ingredients optimize macronutrient metabolism and help maximize muscle mass and decrease body fat, often acting synergistically to achieve their effects.¹⁰⁶ As well, they decrease serum levels of homocysteine, cholesterol and C-Reactive proteins, markers and mediators of heart disease and inflammation in the body.¹⁰⁷¹⁰⁸

As well, dietary intakes of folate, vitamins B12, B6 and B2 have been reported to be inversely related to plasma homocysteine concentration.

Although dietary intakes of **folate**, **vitamins B12, B6 and B2 (thiamine)**,¹⁰⁹ which are all in **ReNew**, have been reported to be inversely related to plasma homocysteine concentration, increased plasma homocysteine is a functional marker of both folate and vitamin B12 deficiency.

Elevated total homocysteine (tHcy) concentrations are a possible risk factor for cardiovascular disease, stroke, neurodegenerative disease, and immune system dysfunction.¹¹⁰¹¹¹¹¹²¹¹³¹¹⁴ As well, hyperhomocysteinemia may be associated with poor cognitive function, possibly through alterations in vascular function,¹¹⁵¹¹⁶¹¹⁷¹¹⁸¹¹⁹ brain atrophy¹²⁰ and depression.¹²¹¹²²

The latest data from the Framingham Offspring Study, the ongoing survey that's tracking the health of successive generations living in the Massachusetts community shows that in older people, higher blood levels of homocysteine are associated with lower mental functioning.¹²³

For people over age 60, Elias and his colleagues report in the American Journal of Epidemiology, increasing levels of total homocysteine in the blood were associated with decreasing levels of cognitive performance in several areas.

Most importantly none of the relations observed were seen for persons under 60 years of age, suggesting that interventions to lower homocysteine early in the adult life span could prevent even modest cognitive deficit related to higher levels of homocysteine (see below about being proactive regarding lowering of homocysteine levels).

Serum homocysteine concentration is influenced primarily by low intakes, poor bioavailability, and poor absorption of folate and vitamin B-12, especially with aging and/or secondary to gastric atrophy.¹²⁴¹²⁵

Folic acid and B12 supplementation lower homocysteine levels and the protective effects of folate, vitamins B6 and B12 in hyperhomocysteinemic patients is well documented.¹²⁶¹²⁷¹²⁸

For example, in the Framingham Offspring Study mentioned above, high vitamin B12 levels correlated with better cognitive performance.

Therapeutic and Anti-Aging Effects of Minimizing Homocysteine Levels

Should we be reactive and/or proactive in dealing with elevated levels of homocysteine and the use of folate, B12, B6 and B2?

High homocysteine levels are associated with risk factors for several conditions and diseases and those with other risk factors should be treated for high homocysteine levels.¹²⁹

However, it's not enough, or perhaps even too late, to deal with the consequences of high homocysteine levels once there is significant disease present. That's because by then the damage has mostly been done and much of it can't be reversed.

Current thinking is leaning toward alleviating elevated levels of homocysteine before any significant damage occurs as normalizing the homocysteine once pathology is present is not likely to reverse the damage although it may prevent further damage.

Several studies have shown the benefits of using folate, B12 and B6 in reducing homocysteine levels in healthy people, before there is significant pathology from the elevated levels. For example in recent study 6 months of supplementation with this trio of B vitamins improved reduced homocysteine levels in healthy elderly women.¹³⁰

Therefore prevention is the key and the time to start thinking about dealing with risk factors such as homocysteine is as early as possible.

However, as with risk factors for other medical conditions, detection of elevated homocysteine levels in adults and treatment with B vitamins at an early stage, before cognitive decline is clinically apparent and pathological changes have appeared, may be an effective intervention.

Dealing with homocysteine levels, even in those who put themselves at risk voluntarily, is likely a useful therapeutic goal. For example one study found that oral folic acid decreases the formation of atheroma in smokers.¹³¹

In this study folic acid supplementation improved endothelial function (in otherwise healthy cigarette smokers. The authors of this study concluded that “Despite the uncertainty by which folic acid exerts its protective effect, it has been shown to be a cheap and safe therapeutic tool in early atherosclerosis.”

Another recent study found that the use of a multivitamin and mineral supplement, which included folate, B12 and B6 decreased plasma homocysteine levels in older healthy adults that were already consuming a folate fortified diet.¹³² There was no decrease in the placebo group, the group that didn’t receive the vitamins.

It seems logical, even though we’re not yet sure of the exact mechanisms involved and the studies showing this have yet to be done, that diseases can be prevented or diminished by proper nutrition starting at a younger age.¹³³

That’s not to say that decreasing homocysteine levels at any stage isn’t useful because it is.¹³⁴ For example there is now substantial evidence of a common decrease in serum/red blood cell folate, serum vitamin B12 and an increase in plasma homocysteine in depression.

As mentioned above, a recent study looking at the treatment of depression concluded that “On the basis of current data, we suggest that oral doses of both folic acid (800 µg daily) and vitamin B12 (1 mg daily) should be tried to improve treatment outcome in depression.”¹³⁵ **These are exactly the amounts of folate and B12 present in ReNew.**

Also since there is also a link between depression, heart disease and increased risk of dying after a cardiac infarction it makes sense to lower homocysteine levels in anyone with depression and/or cardiovascular disease.¹³⁶

Vitamins and Minerals

Recovery and repair of tissues require a host of vitamins and minerals that participate in synthesis of new cells and tissue, and providing these in supplement form can increase health and decrease disease.

For example, the body needs certain vitamins and minerals to make compounds that fight inflammation in the body, including **Vitamin B6, Vitamin E, Vitamin C, niacin, zinc, selenium** and **magnesium**. Many vitamins and minerals also serve as antioxidants and help protect cells against the oxidative damage produced by inflammation. This can be seen in the beneficial

effects of various individual vitamins and minerals, and in the synergistic effects seen among some of these nutrients.

For example hypermetabolism gives rise to increased production of free radicals as a result of increased oxidative metabolism, and this can lead to oxidative damage to parts of the cell and especially the cell membranes and nuclear material.¹³⁷ Micronutrients have important functions in maintaining endogenous antioxidant activity, as well as providing direct antioxidant effects on their own. For example vitamin E and vitamin C have direct antioxidant effects while other nutrients have indirect antioxidant effects as part of metallo enzymes such as glutathione peroxidase (selenium) or superoxide dismutase (zinc, copper) which catalyse removal of the oxidant species.

The micronutrients also have other key functions, such as in modulating gene transcription where they may be involved in either activation of particular genes, or in the control of this activation but this aspect of their function will however only be touched on in this review.

Vitamin C is necessary for collagen synthesis and is a strong antioxidant. Research on vitamin C shows that it may have important effects in reducing pain and inflammation secondary to exercise. In one recent study 400 mg daily of vit C reduced postexercise pain and inflammation.¹³⁸ Vitamin C is involved in the enzymatic hydroxylation of proline to form 4-hydroxyproline, an amino acid that is an integral part of collagen and elastin.

Vitamin B6 and **Vitamin C** are both crucial for optimizing protein synthesis and recovery of the neuromuscular system secondary to physical and mental stress.

As well as being antioxidants, **vitamin E and C**, have been demonstrated to reduce pain in inflammatory conditions such as arthritis possibly by reducing oxidative stress induced by TNF- α , a pro-inflammatory cytokine. And both of these vitamins are also helpful in reducing muscle soreness secondary to exercise. Clinical studies report that supplementing with vitamin E and C reduce post-exercise inflammation and pain in muscles and joints.

Several clinical studies have shown the anti-inflammatory effects of **niacinamide** and its benefits of in both rheumatoid and osteoarthritis. **Pantothenate** or vitamin B5 has been shown in several studies to influence wound healing and collagen synthesis. Some studies have also shown that low levels of pantothenic acid (vitamin B5) are inversely related to increased joint pain and stiffness.

Ample amounts of **vitamin B12** are also included in ReNew in the form of **methylcobalamin**, the metabolically active form of B12. As mentioned above, methylcobalamin, as well as other methyl group donors such as folic acid, betaine, choline, dimethylglycine, methionine, with the aid of B6, have multiple functions in the body including increasing the formation of SAME (see above) and the conversion of homocysteine (high levels are a risk factor for cardiovascular disease) to the essential amino acid methionine. Methylcobalamin has also been shown to have some neuroprotective properties.¹³⁹

ReNew also contains several important minerals including **calcium phosphate**, **potassium phosphate**, **potassium succinate**, **magnesium phosphate**, **manganese**, **chromium**, **selenium**, and **Copper**.

Minerals are required for normal cell function and several serve as cofactors in the many enzymatic processes involved in synthesis of connective tissue macromolecules. **Calcium** and **phosphorus** (in the form of phosphates), and **vitamin D** to regulate both, are important for joint

and bone health. Vitamin D In addition to its effects on calcium metabolism, also plays a role in the normal turnover of articular cartilage.

Boron and **manganese** are critical cofactors for collagen and GAG synthesis and metabolism. Some pharmaceuticals are known to negatively interact with some minerals. Supplementation of these minerals should ensure adequate supply in the body.

Clinical evidence suggests that **zinc** deficiencies have a high impact on connective tissue synthesis. Zinc primarily acts as cofactor in many enzyme systems that regulate cell proliferation and growth and in immune integrity. Diminution of collagen synthesis and strength as well as impaired healing is seen in animal tissues with zinc deficiencies.

Copper is a co-enzyme for lysyl-oxidase, which is essential for the conversion of collagen and elastin, and subsequently for joint function. It also has anti-inflammatory properties.

Omega-3 and Omega 6 Oils – GLA, DHA and EPA -

Dietary fatty acids are precursors for hormones and determine the composition of our cell membranes, influencing the production of pro- and anti-inflammatory substances.¹⁴⁰

Omega-3 fatty acids, found in fish oils (mainly **EPA** and **DHA**) and flaxseed oil, have been shown to reduce oxidant stress¹⁴¹ (oxidative stress or free radical damage is a factor of importance in the development of inflammatory events) and suppress the production of pro-inflammatory compounds in the body and therefore influence inflammatory conditions such as arthritis, diabetes, inflammatory bowel disease, cancer, autoimmune disorders, and aging.^{142 143144145146147148149150151152153154155156}

They have also been shown to have tissue protective effects, including improving serum lipids and cardiovascular protection,¹⁵⁷¹⁵⁸¹⁵⁹¹⁶⁰ protection against stress,¹⁶¹ cognitive aging¹⁶²¹⁶³ and depression.¹⁶⁴

Gamma linolenic acid (GLA) is important for health and has suppressive effects on both acute and chronic inflammation, and effects on decreasing the response to anxiety and stress.¹⁶⁵¹⁶⁶¹⁶⁷¹⁶⁸¹⁶⁹¹⁷⁰

It also works synergistically with some of the essential fatty acids to decrease inflammation and stress responses.¹⁷¹¹⁷²¹⁷³

Calcium, Magnesium

Calcium, while generally considered a key element for maintaining bone density and strength, also has other health benefits including reducing blood pressure,¹⁷⁴ and more importantly for both men and women losing weight, the prevention of any adverse effects of dieting on bone mass and a preventative effect on osteoporosis.¹⁷⁵

For example, calcium can also help lower your cholesterol.¹⁷⁶ In a recent study it was found that people with cholesterol levels in the high range of 240 to 260 reduced their

total cholesterol by 6 percent when they took in an extra 1,800 milligrams of calcium a day. And the best part is that LDL (low-density lipoprotein) cholesterol--the bad cholesterol that's implicated in coronary artery disease, dropped by 11 percent. As well, calcium has recently been inversely associated with the incidence of colorectal adenomas.¹⁷⁷

But there's more. Calcium has also been shown to modulate the inflammatory response¹⁷⁸ and to increase weight loss. A recent study found that an increase in dietary calcium intake, together with a normal protein intake, increased fecal fat and energy excretion by about 350 calories per day.¹⁷⁹ This observation may help explain why a high-calcium diet produces weight loss, and it suggests that an interaction with dietary protein level may be important.

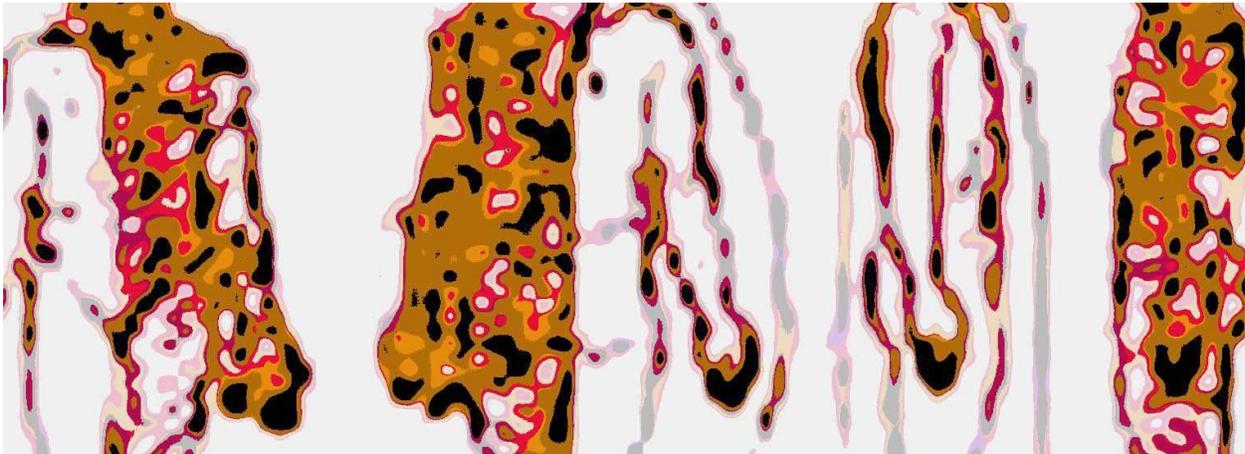
Magnesium, besides complementing the effects of calcium it also has important effects on its own. Low levels of magnesium promote inflammation¹⁸⁰¹⁸¹ and impact on the body's ability to handle stress.¹⁸² These functions are useful in alleviating the release of pro-inflammatory cytokines, and decreasing both insulin resistance and inappropriate cortisol secretion.

Biotin

Biotin is a water-soluble vitamin that acts a cofactor for several of the carboxylases involved in fatty acid synthesis, gluconeogenesis, and branched-chain amino acid (BCAA) metabolism.

The ketogenic phase of my diets and any ketogenic/low carb diet increases biotin bioavailability and consumption, and hence, promotes energy production by gluconeogenesis and branched-chain amino acid metabolism, which can result in biotin deficiency. A recent paper concluded that "It is suggested that individuals that consume the ketogenic diet have an increased biotin requirement."¹⁸³

Is Stress an Inflammatory Condition?



To a lot of people the concept that inflammation may be behind much of our health problems may sound far fetched. But it's not. Who would have even imagined a few decades ago that ulcers were caused by bacteria? But they are. And today treatment involves the use of multiple antibiotics.

The idea of inflammation being at the root of many problems and diseases is an idea that is now starting to hit the mainstream – as seen by the 2004 Time cover story on inflammation.

However, because it's not intuitive, at least at this point in our common understanding, we need to explore some of the current concepts linking inflammation and obesity.

Most of us equate inflammation with infections and injuries. Something we can see or feel. Like a boil on our skin, or a chest infection, or a swollen strained ankle. Or perhaps an ear infection in a child, with fever, aches and pains, and all the rest.

What we're actually seeing, however, in all of these cases are the results of inflammation secondary to injury of some sort, infectious or traumatic, and thus simply the body's response to the insult. The actual inflammatory process underlies it all and is much more than just what we see or feel.

In fact inflammation is a complex process that can be measured not only by the changes that take place with obvious infections, but also by measuring the markers in the body that uncover the fact that an inflammatory process is going on, even if the inflammation is not obvious or doesn't result in any symptoms.

Most of us, and certainly all of us as we get older, have some evidence of chronic inflammation. In most cases, although it's nothing we can put a finger on, there is something going on in our bodies that are making it react as if it we are going through some sort of long term, low level, infection. We can detect this inflammation by measuring certain markers of inflammation in our bodies, including pro-inflammatory

cytokines such as C-reactive protein (CRP), interleukin-1-beta (IL-1 beta), interleukin-6 (IL-6), and tumor necrosis factor alpha (TNF-alpha).

Low levels of inflammation, as shown by these and other inflammatory markers are linked to various diseases and conditions, including insulin resistance, the metabolic syndrome, diabetes, coronary artery disease, arthritis and obesity.

Proinflammatory cytokines are found in a number of diseases associated with advancing age, such as rheumatoid arthritis, diabetes, infection, cancer, cardiovascular disease, cerebrovascular disease, anemia and gingivitis.

It's also been shown that an increase in inflammatory mediators predicts the future development of cardiovascular disease, obesity and diabetes and, interestingly enough, depression.

But there's more to the story. Reducing the pro-inflammatory cytokines results in an increase in levels of IGF-I, resulting in an increase in protein synthesis, fat breakdown and oxidation of fatty acids, and anti-catabolic effects on muscle mass.¹⁸⁴¹⁸⁵

As we've seen, ReNew contains several ingredients that reduce inflammation and the production and levels of pro-inflammatory cytokines and thus provides another tool in dealing with various diseases and aging.



The Fires Within

Inflammation is the body's first defense against infection, but when it goes awry, it can lead to heart attacks, colon cancer, Alzheimer's and a host of other diseases

Quality of the Ingredients in ReNew

ReNew, like the other MD+ products, contains the highest quality and most effective ingredients. Although it's more expensive, the higher quality ingredients, and the right type of ingredients, give you more value as they have more effects. And as important, the degree of contamination, especially by heavy metal and pollutants, is much less than in the less expensive ingredients.

For example, the various amino acids used in ReNew, and in my other products, are filtered and purified to a greater extent than the cheaper quality amino acids. So even though the products from two different companies may have the same amino acid content, the quality and purity of the amino acids may be quite different.

Part of Cellusol



ReNew is a premier product that is also part of the Cellusol team. It enhances and stabilizes weight and fat loss and allows the body to return to an optimal metabolic and immune state where it's once again ready and able to respond to the next two Cellusol cycles.

With ReNew you return to a state where the body solidifies previous weight and fat losses and is once again sensitive and responsive to both Thermo and Metabolic. In a sense, ReNew rejuvenates your body so that it is ready and able to make dramatic weight and fat losses.

CELLUSOL

The Six-Week, Three-Phase Cellulite and Weight Loss Solution



Cellusol is a three-phase supplement and the most advanced weight and fat loss formula ever. It has been formulated to accomplish maximum weight and fat loss, including cellulite, while at the same time minimizing the loss of muscle.

ReNew Supplement Panel

Supplement Facts: Serving Size: 5 Tablets Servings Per Container: 24					
	Amount Per Serving	% Daily Value		Amount Per Serving	% Daily Value
Beta-Carotene	5,000 IU	100%	Iodine (as potassium iodide)	150 mcg	100%
Vitamin B2 (as riboflavin)	25 mg	1,470%	Manganese (as manganese gluconate)	2 mg	100%
Vitamin B3 (as niacinamide)	25 mg	125%	Copper (as copper gluconate)	800 mcg	40%
Pantothenic Acid (as d-calcium pantothenate)	50 mg	500%	Renew™ Proprietary Complex	6082 mg	
Vitamin B6 (as pyridoxine HCL, pyridoxal-5-phosphate, pyridoxyl alpha ketoglutarate)	25 mg	1,250%	Alpha Lipoic Acid, Arginine Alpha-Ketoglutarate,		
Folic Acid	800 mcg	200%	Artichoke Extract (Luteolin), Ashwagandha, Astragalus,		
Vitamin B12 (as methylcobalamin)	1000 mcg	16,670%	Betaine (Trimethylglycine), Beta-Sitosterol, Boron (Chelate),		
Biotin	200 mcg	67%	Burdock, CDP Choline, Apple Pectin, Cellulose, Chlorella,		
Vitamin C (as ascorbic acid)	250 mg	417%	Choline (Bitartrate), Cilantro, Citrus Bioflavonoids,		
Vitamin E (d-alpha-tocopherol succinate)	100 IU	333%	CLA (Conjugated Linoleic Acid), Co-Enzyme Q10,		
Calcium (as calcium phosphate)	100 mg	10%	Curcuma Longa, DHA, EPA, DMAE, DMG (Dimethylglycine),		
Magnesium (as magnesium phosphate)	50 mg	13%	Echinacea, Ginkgo Biloba, GLA, Glutathione, Huperzine A,		
Zinc (as zinc citrate)	10 mg	67%	Kelp, L-Arginine, L-Carnitine, L-Carnosine, L-Cysteine,		
Selenium (selenomethionine)	25 mcg	36%	L-Glutamine, L-Leucine, L-Lysine, L-Methionine,		
Chromium (as CHROMEMATE polynicotinate)	100 mcg	83%	L-Threonine, L-Tyrosine, Mucana Pruriens, N-Acetyl Cysteine,		
Potassium (as potassium phosphate)	99 mg	3%	Ocimum Sanctum, Potassium Succinate, Quercetin Dihydrate,		
			Panax Ginseng, Red Reishi, Rhodiola Rhosea, Schisandra,		
			Silymarin (Milk Thistle), Suma (Root).		
Other Ingredients: Stearic Acid, Magesium Stearate, Silicon Dioxide, Modified Cellulose Gum, Hydroxypropylmethyl Cellulose.					
*Daily Value Not Established					



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