

Vitamin Research News

Dedicated to the Scientific Pursuit of Better Health

JANUARY 2007

Vol. 21, Number 1

\$29.95/Year U.S. (\$39.95/Year International)

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Lectins: Their Damaging Role in Intestinal Health, Rheumatoid Arthritis and Weight Loss

by Carolyn Pierini, CLS (ASCP), CNC

Located on the surface of cells of all living things lay many thousands of different complex sugar molecules (glycoconjugates) projecting outward from their loose anchors like moving antennae. Genetically unique, these molecules comprise a protective coating for the cell and perform many functions including cell recognition and signaling. Lectins are a class of protein molecules capable of using these sugar moieties to bind to the surface of cells. Lectins provide the way for one molecule to stick to another molecule

without any immunity involved. Lectins play a wide role in health, but their ability to influence the inflammatory process indicates they are involved in inflammatory bowel disease, rheumatoid arthritis and even weight gain. Lectins' potential involvement in many aspects of our health caused DJ Freed, MD to state, "Lectins are causes in search of diseases."

This article will introduce you to the world of lectins, the "sticky proteins" we

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Five Critical Components to Healthy Aging: Preserving Factors Integral to an Active Lifestyle

by Chris D. Meletis, ND

A majority of the American population seems to equate old age with being inactive and unhealthy. The assumption is generally made that once we surpass a certain age we will not be as active as we once were, that the choice to remain healthy has been taken away from us by Father Time.

However, the research does not support this conclusion. Rather, the medical literature shows that we have the ability to age in a healthy, active manner. In fact, evidence supports the fact that how we age is not a predetermined conclusion but rather a choice that we make based on lifestyle and

nutritional factors such as the amount of vegetables we consume and the amount of exercise we receive.¹⁻²

Studies suggest that making the right health choices in middle age can play an important part in maintaining an active lifestyle later. One group of researchers investigated which factors are associated with overall survival and exceptional survival (free of a set of major diseases and impairments to ages 75, 80, 85, or 90 without incidence of six major chronic diseases and without physical and cognitive impairment) in 5,820 Japanese American

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Lectins

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deal with from day to day in our diets and our bodily systems. Furthermore, you will learn how you can build up your defenses against what could be a hidden cause behind many of our health concerns.

Learning About Lectins

Lectins, not to be confused with the endocrine hormone leptin, are types of proteins commonly found in nature in foods such as fruits, vegetables, and seafood, but especially grains, beans and seeds. They are present in about 30 percent of the American diet and are not degraded by stomach acid or proteolytic enzymes, making them virtually resistant to digestion. Microbes carry lectins and use them for attachment to the host cells. The human body contains lectins: 1) On the vascular endothelial linings (selectins) in order for blood cells to escape into the tissues; 2) In the liver to capture microorganisms, and 3) As opsonins, substances that coat foreign antigens, making them more susceptible to phagocytosis (the process where immune cells digest and destroy foreign invaders) by the white blood cells. C-reactive protein (CRP) and mannose-binding protein (MBP) are two examples of opsonins.

The word “lectin” comes from the Latin phrase, “I choose,” a befitting word choice since lectins are very specific as to what they will bind to. Lectins are also called

agglutinins because in their binding to many cell surfaces they cause agglutination (cell clumping) reactions. Ricin, for example, from castor beans is such a potent lectin that just a minute amount is capable of causing death due to massive clotting of red blood cells from agglutination. Ricin even has been used as a murder weapon in espionage.

A lectin serves the plant as a type of primitive protection system analogous to an antibody but in a non-immune model. Likewise, human lectins in our bodies also act protectively but as part of an immune system. Known for a century, lectins form a diverse group of molecules of varying molecular weights and shapes and contain multiple binding sites. The only thing lectins have in common with each other is their ability to bind to sugars. Lectins bind to the terminal sugar, the “glyco,” portion of glycoconjugates found on cell membranes. If the sugars are bound to proteins they are called glycoproteins or bound to fats they are called glycolipids. Collectively they are called glycoconjugates of which 11 percent of the human body is composed.

The important point is that some of the lectins consumed in everyday foods act as chemical messengers that can in fact bind to the sugars of cells in the gut and the blood cells, initiating an inflammatory response. In wheat, gliadin, a component of gluten and an iso-lectin of wheat germ agglutinin (WGA), is capable of activating NF kappa beta proteins which, when up-regulated, are involved in almost every acute and chronic inflammatory disorder including neurodegenerative disease, inflammatory bowel disease, infectious and autoimmune diseases.¹ WGA needs more recognition as an important dietary problem. Scientific literature shows that dietary lectins can dramatically reduce natural killer (NK) cell activity directly and through disruption of intestinal flora. Natural killer cells are one of the body’s most important defenses against viruses and other invaders.

Most dietary lectins will also stimulate polyamine production in the gut. Polyamines are important growth factors that may have negative effects if levels become imbalanced. Excess polyamine production initiated by lectins may be the result of an effort to repair the damage

to intestinal microvilli caused by lectins. In addition, a high polyamine level may also decrease NK cell populations², can contribute to halitosis (bad breath), and is considered an important biological marker for colonic precancer.³⁻⁶ A number of animal studies have shown that an increase in polyamines caused by a high lectin diet resulted in increases in the size of the intestines, liver, and pancreas.⁷

Lectins, Food Allergies and Intestinal Concerns

There is an abundance of literature from the most prestigious journals that lectins such as WGA initiate allergic reactions in the gut causing the release of IL-4, IL-13, and histamine from human basophils producing noticeable allergic symptoms.⁸⁻⁹ WGA has also shown to interfere with protein digestion and increase gut permeability.¹⁰⁻¹¹ Peanut lectin, kidney bean and soybean lectins are other examples of lectins that have influences on bodily tissues. On the bright side, the lectins in broad beans (VFA), jackfruit (JAC), and culinary mushrooms (*agaricus bisporus*) have been shown to slow the progression of colon cancer.¹²⁻¹³

Lucretius said, “One man’s food is another man’s poison” and lectins give us part of the reason why. It is our individual genetic inheritances that determine how and to what degree lectins can affect us. Almost everybody has antibodies to some dietary lectins in their bloodstream. Many food allergies are actually immune system reactions to lectins.¹⁴

The trend toward consumption of less processed grain foods, although more nutritious in many respects, results in consumption of more lectins. After ingestion, most dietary lectins bind to the absorptive microvilli of the small intestine (the microvilli are the tiny finger-like projections on the epithelial cells). From there lectins may gain access into the blood and lymph system through a process called endocytosis which carries the intact lectin across the microvilli membranes as a vesicle.¹⁵ Then, the lectins may enter the liver, pancreas and systemic circulation. It is estimated that about 5 percent of ingested lectins enter the body systemically, where, depending on the lectin and depending on the person’s unique glycoconjugates, lectin binding occurs on other tissues such

Vol. 21 • Number 1 JANUARY 2007

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as nervous and connective tissue and the bladder, which are very sensitive to the agglutinating effects of lectins. It is a clinical observation that the complete avoidance of wheat lectins will help ameliorate the symptoms of interstitial cystitis. The reactions of lectins in the gut are more potent since the gut is more heavily glycosylated (more sugar receptors). As intestinal cells age they become less glycosylated due to the loss of glycoconjugates. The intestinal lining of people with Crohn's disease and IBS (irritable bowel syndrome) appear to be more sensitive to the effects of food lectins because the lining is constantly being replaced by new tissue that is made up of immature cells that are more glycosylated and thus more susceptible to lectin attachment. It becomes a vicious cycle. Blood group antigens as glycoconjugates are found on the surface of cells lining the digestive tract in addition to the blood cells and are frequently the target of specific lectins resulting in agglutination reactions. The same reactions in vitro are conducted daily in the clinical lab blood bank as "blood typing."

Lectins have many other applications in the clinical laboratory from identification of microorganisms to cancer research where lectins serve as probes to investigate the working of the cell through its surface biology. Lectins have been used as carriers for the delivery of chemotherapeutic agents. Mitosis (cell division) can be enhanced with lectins such as pokeweed lectin (PWA).

Lectins and Rheumatoid Arthritis

The fact that lectins appear to aggravate existing inflammatory conditions can be seen in the example of rheumatoid arthritis.¹⁶⁻¹⁸ The RA antibody is different structurally from a normal antibody in that the side-chain sugar, galactose, is replaced with N-acetyl glucosamine, the sugar for which the wheat germ lectin (WGA) is highly specific. This may point to why patients with rheumatoid arthritis feel better on a wheat-free diet. The defective RA antibody has also been shown to be reactive with the lectin found in the common lentil bean. According to the eminent immunologist David Freed, "Of the various rheumatogenic foods, wheat and other grains top the list. Avoidance of these is frequently the only dietary maneu-

ver required, especially in early cases." He proposed that ingested wheat lectin (and other dietary lectins) enter the bloodstream from the intestine and bind strongly to connective tissues (which contain considerable quantities of glycoprotein) and skin proteoglycans making them stiff.¹⁹ It is a clinical observation that inflammation of the gut is associated with inflammation of the joints. It has been also observed that the pain and inflammation of fibromyalgia may stem from or be contributed to by intolerance to wheat lectins. In fact, lectins are capable of intensifying the effects of autoimmune disorders in general. Nightshade vegetables like potatoes and tomatoes are very high in lectins and are known to trigger the symptoms of arthritis.

Sticky Proteins in Weight Management

A very important and interesting feature of some lectins is their ability to mimic hormones. As one can imagine, this could contribute a significant impact on metabolism. The hormone insulin stores excess carbohydrates (glucose) as fat. It accomplishes this by attaching itself to the insulin receptor found on the fat cell. Under stimulation from insulin, the fat cell becomes more permeable to glucose, which would otherwise remain in circulation. With mission accomplished, the insulin hormone then disconnects to its receptor. In many people, lectins found in lentils, green peas, corn, potatoes but especially wheat germ agglutinin (WGA), are known to bind to the insulin receptor giving the fat cell the same message that insulin gives, namely to make fat. The lectin, however, due to a lack of feedback inhibition, remains indefinitely attached to the receptor giving the cell a constant message to make fat.²⁰⁻²⁵ This perhaps explains why many weight loss programs that include a moderate-to-high amount of carbohydrate (especially modern grain) fail.

One other point with regard to lectin contribution to weight gain is the fact that lectins have been shown to block digestive hormones. WGA can bind to the receptor for cholecystokinin (CCK), a hormone involved in appetite control, suppressing its function.²⁶⁻²⁷ This essentially leads to an increase in appetite and impairment in the release of digestive enzymes.

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The President's Desk

Going Green

Vitamin Research Products has always made a firm commitment to implementing environmentally friendly procedures. I'm pleased, therefore, to announce that beginning in January we are undertaking our most recent "green" practice—printing this newsletter on recycled paper. We have decided to make this change, even though it will cost more, because it will help conserve the earth's limited natural resources. You will notice the new paper beginning with this issue of the newsletter.

The switch to recycled paper is part of a more expansive environmentally friendly philosophy at VRP that includes a number of green practices. For example, during manufacturing, rather than expel dust into the environment, our state-of-the-art air filtration system pulls in dust and filters it out of the air.

Other green practices at VRP include: 1) Using organic cotton in our supplement bottles; 2) Shipping our orders in packing material made of potato starch rather than polystyrene; 3) Using supplement bottles and recycled boxes that are both recyclable; 4) Using a high-output, low-energy lighting system in our building, which uses less electricity and is less stressful on our employees' eyes; and 5) Converting most of our supplement capsules to "Veggie Caps," to address the concerns of anyone worried about bovine spongiform encephalopathy (mad cow disease).

Finally, our facility was built with a special energy efficient foundation as well as energy efficient windows, insulation, and flash water heater systems. We have even pre-planned the facility for the use of solar power as a partial energy source in the future.

By implementing all these practices, not only will VRP protect the health of our customers—we'll also protect the health of the planet.



Robert Watson
President/CEO

Lectins

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Detrimental Dietary Component

Consider the fact that there are many varieties of wheat grown worldwide. Ancient wheat species had much lower protein contents than the modern varieties. Lectins are proteins. Increasing the protein component has also increased the lectin load with the resultant potential for inflammation and metabolic disruption. Genetic altering of grain plants (GMO) has also changed the lectin content.

Interestingly, lectins are destroyed in the sprouting process, which allows for a safer form of grain consumption, not to mention that the sprout is generally higher in overall nutritional value than the seed. Organic, sprouted grain bread products (with no added gluten) appear to be the safest and healthiest way to reap the nutritional benefit of grain without the lectin burdens.

Some lectins are resistant to heating by cooking. As a side note, soaking beans before cooking them reduces the lectin content dramatically. Most people do not know why beans prepared this way makes them easier to digest but it is simply because the water-soluble lectins have been nearly completely removed through the changing of the water during soaking.

Protecting Against Lectins

Because lectins are so prevalent in a typical diet, undertaking a supplement regimen to help combat the damaging effects of lectins can help contribute to optimal health, improve the health of the intestinal tract and contribute to weight loss. Certain seaweeds, especially those high in the sugar fucose (Bladderwrack) and mucilaginous vegetables like okra have the ability to bind to lectins in a way that makes them unavailable to the vulnerable cells of the gut. These foods act as sacrificial decoys and attach to the problematic lectins that would ordinarily attach and bind to gut epithelial cells. A specific glycoprotein, N-acetylglucosamine (NAG), is also a favorite target for dietary lectins and is concentrated in connective tissue. Supplementation with NAG is an excellent strategy for lectin protection. Another sugar with similar activity is D-mannose, which is capable of binding to lectins

located on the cells of microorganisms. Some bacteria responsible for urinary tract infections contain lectins specific for the sugar mannose and use these lectins to bind tightly to mannose-rich tissue in the bladder walls, initiating urinary tract infections (UTIs).²⁸ As with Bladderwrack and NAG, supplementation with D-mannose provides a decoy for these lectins and protects the bladder. Supplementing prior to a meal with these decoy sugars allows for the binding of potentially harmful lectins and protection from attack. This concept of lectin-shielding devices has exciting clinical application now and in the future.²⁹

Conclusion

The subject of lectins is very broad and deserves more discussion. There are even some lectins that are beneficial to the body, such as those found in some species of edible snails, which may be capable of preventing the metastasis of cancer cells.³⁰ The involvement of lectins in our health and their relationship to degenerative disease is still an emerging science. Studies performed on animals will continue to be the model in the future for the study of lectins. The glycosylation of the human gut is basically similar to that of higher animals and it may be confidently predicted that the effects of dietary lectins will have similarities in both humans and animals. In short, dietary lectins, by their chemical reactivity with cell surface receptors on the intestinal epithelium, are metabolic signals for the gut and are capable of modulating immune and hormone functions.¹⁴

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CoQ10-H₂TM: New Bioavailable Form of One of Nature's Most Powerful Antioxidants

by Jeffrey Reinhardt, MSc

In today's fast-paced world, everyone needs more energy to feel better, and to thrive as life becomes increasingly more stressful. One of the most important nutrients we can consume to help increase our body's energy production is Coenzyme Q10 (CoQ10). This powerful antioxidant plays a wide role in various aspects of health and has been studied in patients with cardiovascular concerns, asthma, and Parkinson's disease as well as in people who are at risk for a CoQ10 deficiency. Because CoQ10 is so vital to health it's important we consume the most bioavailable form possible in order to ensure it is properly delivered to the sites that can benefit from it the most. This article will serve as a review of the ways CoQ10 affects our health and will describe a new form of CoQ10 that is more bioavailable and therefore highly advantageous.

CoQ10 and Heart Health

One of CoQ10's best-known actions is its ability to protect the health of the heart. As Ward Dean, MD reported in the July 2004 issue of *Vitamin Research News*, a number of studies have confirmed CoQ10's effectiveness in improving cardiac function in cases of cardiomyopathy and congestive heart failure. In one six-year study of 122 patients with New York Heart Association classes II, III and IV chronic dilated cardiomyopathy, subjects were treated with 100 mg CoQ10 each day. At the beginning of the study, the mean ejection fraction, a measure of ventricular blood flow, was 41 percent. Ejection fraction increased to 59 percent after only six months on CoQ10. Eighty-seven percent of the participants experienced significant improvement in their ejection fraction during this time, and improved by one or two New York Heart Association classes. Those in class II achieved the greatest benefit. All of these subjects became asymptomatic after CoQ10 administration. Despite these positive results, the authors suggested that the

100 mg dose of CoQ10 was too low, and the subjects might have done even better on higher doses.¹

A recent placebo-controlled study of 62 subjects undergoing cardiac surgery further explored CoQ10's role in heart patients. Preoperative oral coenzyme Q10 therapy in patients undergoing cardiac surgery resulted in increased protection of heart muscle against the deprivation of oxygen and the reintroduction of oxygen (hypoxia-reoxygenation). The study authors found that CoQ10 may protect the heart and preserve mitochondrial function after cardiac surgery.²

In studies on angina pectoris, CoQ10 reduced anginal frequency and nitroglycerin use and increased exercise time and time to ST-segment depression.³ (ST-segment is an abnormality on an electrocardiogram indicating the heart is not getting enough oxygen, presenting an increased risk of heart attack.)

CoQ10 is also helpful in hypertension and has been known to reduce systolic blood pressure by an average of 17.8 mmHg.⁴

Other Uses

Another beneficial application of CoQ10 is for athletes, body builders and performers who want to have both greater endurance and muscle power coupled with reduced recover times after heavy workouts or peak performances. Because of its ability to affect mitochondrial health, CoQ10 also has been studied in Parkinson's patients. Supplementation in this group of patients has resulted in 44 percent less decline in mental function, movement and ability to perform daily living tasks compared to those taking the placebo.⁵ Studies also have shown that CoQ10 has anti-migraine action,⁶ improves sperm motility in semen,⁷ and reduces corticosteroids dosage in patients with bronchial asthma.⁸ Since cholesterol-lowering statin drugs are known to deplete CoQ10 levels, CoQ10

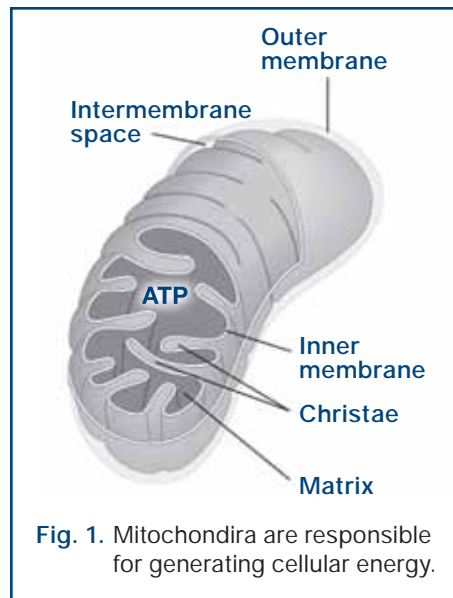


Fig. 1. Mitochondria are responsible for generating cellular energy.

supplementation is also recommended for anyone consuming these drugs to counteract their toxic effects. Furthermore, researchers have found that women taking oral contraceptives have low levels of this important antioxidant.⁹

Enhanced Energy Production

CoQ10 is vitally important to help the body stay energized. To understand why this is the case, we must look at the way CoQ10 is metabolized. Coenzyme Q10 is a crucial fat-soluble molecule that plays an essential role in electron transport to produce energy in the form of adenosine triphosphate (ATP). ATP production occurs in the inner membranes of mitochondria (see Fig. 1); this bioenergetic process is called oxidative phosphorylation and requires Coenzyme Q10, which is cycled continuously, from its oxidized form CoQ10-Ox or ubiquinone, to its reduced form CoQ10-H₂TM, which is called ubiquinol. In addition to its crucial function in ATP synthesis in mitochondria, the reduced form of Coenzyme Q10, as CoQ10-H₂, is a fat-soluble antioxidant that traps and inactivates free radicals, particu-

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Healthy Aging

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middle-aged men living in Honolulu. The men were followed for up to 40 years.³

Of the original participants, 2,451 (42 percent) survived to age 85 years and 655 participants (11 percent) met the criteria for exceptional survival to age 85 years. The researchers found that both groups of men (those in the overall survival group and the exceptional survival group) had a number of common factors including being able to maintain high grip strength and avoidance of factors such as overweight, hyperglycemia, hypertension, smoking, and excessive alcohol consumption. In addition to these factors, the subjects who were categorized into exceptional survivors also were able to maintain healthy levels of triglycerides.

According to the researchers, “These data suggest that avoidance of certain risk factors in midlife is associated with the probability of a long and healthy life among men.”

As this study demonstrates, taking the proper nutritional steps now can be the driving factor behind what an individual's life will be like in later years. As I share with my patients, “Genetics may load the gun, but diet and lifestyle pull the trigger.” Clearly, individuals armed with the proper knowledge can choose to develop habits that will preserve their active lifestyle throughout their later years. One of the most important lifestyle habits we can develop is to build a supplement regimen designed to preserve some of the most significant factors involved in healthy aging. These factors include heart health, cognition, joint health, blood sugar control, and vision. In this article, I will address each of these factors and explain the most critical nutrients we can consume to ensure we preserve our health throughout the “golden years.”

Blood Sugar Control

One of the most important factors in maintaining a high quality of life during the aging process is blood sugar control. Even if we never contract full-blown diabetes, as we age, our bodies become more prone to insulin resistance. More and more insulin is produced by the body to compensate for the elevated blood sugar that

occurs after the consumption of sugar and refined carbohydrates. This ultimately results in the body becoming progressively more immune to insulin's effects, which in turn results in persistent weight gain and obesity. Overweight elderly are at increased risk of mortality, morbidity, and functional disability. Furthermore, higher waist circumference, waist-to-hip ratio and body mass index significantly increase the odds of acquiring various cardiovascular disease risk factors.⁴

In addition, high blood sugar itself is linked to various aspects of cardiovascular health, including strokes. Stroke is one of the main causes of disability in the elderly and along with Alzheimer's disease is one of the main reasons seniors give up their independent living. Animal and human studies have linked hyperglycemia in the acute phase of ischemic stroke to worse clinical outcomes regardless of the presence of pre-existing diabetes.⁵⁻⁶

Because it has such wide-ranging implications to our health, blood sugar control, therefore, even as early as in middle age, is one of the most important ways we can preserve quality of life and our level of activity throughout the senior years.

A number of nutrients have been found to effectively support healthy blood sugar levels. Bitter melon (*Momordica charantia*) contains substances with antidiabetic properties such as charantin, vicine, and polypeptide-p, as well as other unspecific bioactive components such as antioxidants. Metabolic and hypoglycemic effects of bitter melon have been demonstrated in cell culture, animal, and human studies. In one study, diabetic patients consuming bitter melon were able to reduce by half their dosage of antidiabetic drugs, leading the researchers to conclude “the extract acts in synergism with oral hypoglycemics and potentiates their hypoglycemia in NIDDM [type 2 diabetes].”⁷

Bitter melon also has been shown to have anti-obesity effects in rats.⁸

Another blood-sugar supporting nutrient is Goat's rue. Goat's rue is rich in guanidine, its hypoglycemic component. The guanidine in goat's rue improves insulin sensitivity and causes a long-lasting reduction of blood sugar content in rats and an increase in carbohydrate tolerance. Goat's rue extracts have increased glycogen levels in the liver and myocardium of both

healthy and diabetic rabbits. In addition, this potent herb stabilizes blood sugar in both normal and diabetic humans.⁹

Recently, one of the most extensively studied natural hypoglycemic agents has become cinnamon. In one double-blind study of 79 patients with type 2 diabetes, the subjects were randomly assigned to take either 3 grams of cinnamon extract or a placebo three times per day for 4 months. In the cinnamon group, fasting plasma glucose levels declined significantly more (10.3 percent) compared to the placebo group (3.4 percent). The decrease in plasma glucose correlated significantly with the baseline concentrations, meaning subjects with a higher initial plasma glucose level benefited more from cinnamon intake than the diabetic subjects who already had a better grasp of glucose control.¹⁰

Heart Health

Another key component to maintaining a high quality of life during aging is cardiovascular health. Researchers have found that people who live to be 100 or older have largely avoided health conditions or behaviors linked to negative cardiac events. When they investigated 93 centenarians and compared them to 90 individuals age 40 to 60 years, they found that although hypertension occurred more often in the 100 plus group, smoking, overweight and high cholesterol were found statistically more often in a younger population. More than half of the centenarians had either none or no risk factors for cardiovascular disease whereas only 14.2 percent of younger subjects experienced none or one risk factor.¹¹⁻¹²

The authors concluded, “Centenarians are characterized by a much better cardiovascular risk profile than middle-aged individuals. This indicates that longevity is related to low cardiovascular risk.”

Cholesterol is considered the prime marker of heart health. Research has shown that maintaining healthy levels of cholesterol is a predictor of how active we remain during the aging process. In one interesting study, researchers evaluated the relationship between lipoprotein parameters and disability over a period of 2 years, in 344 institutionalized elderly aged over 65 years. They were divided into two groups according to their disability level. Severe disability was associated with low

HDL levels and subjects who experienced a decline in their functional ability consistently showed lower basal HDL levels compared to subjects with stable/improved functional status.¹³

According to the researchers, “The results of this study suggest that in the elderly severe disability is strongly associated with low HDL-C levels. Longitudinal data support the hypothesis that low HDL-C might be considered as a marker for ‘ongoing’ disability.”

In addition to being a marker of disability, as mentioned above, high-density lipoprotein cholesterol is a proven anti-atherosclerotic agent in animal models of atherosclerosis. It acts through the principal mechanisms of accelerating cholesterol efflux and inhibiting oxidation and inflammation. Nature has provided us with a number of substances that can lower overall cholesterol and increase HDL levels. Studies have shown that niacin exerts a powerful ability to raise HDL levels by 25 to 35 percent at the highest doses.¹⁴

Red yeast rice extract contains cholesterol-lowering compounds, some with antioxidant effects. Red yeast rice contains a family of nine different compounds that all have the ability to inhibit HMG-CoA reductase. Other active ingredients in red yeast rice include sterols, isoflavones, and monounsaturated fatty acids.

A double-blind, placebo-controlled trial of a red yeast rice supplement confirmed the theory that it is a synergistic effect between all the components of red yeast rice that results in cholesterol reduction. In this study, 80 subjects demonstrated a significant decrease in cholesterol levels from 250 mg/dL to 210 mg/dL over 8 weeks independent of diet.¹⁵

In another human study on red yeast rice, conducted in China, the treatment group had an 18 percent lower mean total cholesterol level compared to placebo and a 17 percent drop in total cholesterol from baseline. There was also a 23 percent difference in LDL between the treatment group and the placebo group and a 23 percent drop in the treatment group, evident at eight weeks. Furthermore, triglycerides dropped 16 percent in the treatment population. There were no changes in HDL levels.¹⁵

Red yeast rice extract may also influence weight control. In vitro, it has been shown

to suppress adipogenesis, the formation of fat cells.¹⁶

Although human trials have not shown elevations of liver enzymes or renal impairment, because red yeast rice contains a natural statin, it’s recommended that individuals supplementing with red yeast rice also take CoQ10 as the pharmaceutical statins have been shown to deplete CoQ10 levels.

Gugulipid is another lipid-lowering substance. It appears to work best in a subgroup of the population whose LDL cholesterol levels are above 160 mg/dl (normal levels should be below 100). In this group of patients it has been shown to lower triglyceride levels by 14 percent at a 3,000 mg per day dose and 10 percent at a 6,000 mg per day dose. Gugulipid also reduced Lipoprotein a [Lp(a)] (another risk factor for heart disease) by 7 percent and 5 percent for the low dose and high dose respectively. One of its most interesting effects, however, appears to be its ability to reduce levels of C-Reactive Protein (CRP), a marker of inflammation and a risk factor for cardiovascular disease. High-dose gugulipid reduced CRP by 29 percent and low-dose gugulipid by 25 percent.¹⁷

While cholesterol is considered an important cardiovascular risk factor, over the last several decades an increasing awareness has emerged over the possible role homocysteine may play in heart health. Studies have shown an independent association between high homocysteine levels and coronary heart disease.

According to a recent review of the literature, high homocysteine is responsible for about 10 percent of total risk of cardiovascular diseases. The review estimated that reducing the homocysteine concentration in blood by 3 mol/liter (with daily intake of 0.8 mg of folic acid) reduces the risk of ischemic heart diseases by 16 percent, vein thrombosis by 25 percent, and stroke by 24 percent. Six months’ therapy with folic acid, vitamin B12 and vitamin B6 reduces the frequency of cardiovascular occurrences, the review concluded. Furthermore, the review estimated, high plasma homocysteine concentrations doubles the risk of having a myocardial infarction (heart attack).¹⁸

Other studies have shown that betaine can help reduce homocysteine levels, especially in rare instances when B vitamins are ineffective.

Cognitive Enhancement

Although we often think of physical disability during the aging process as the main factor preventing us from leading an active life, cognitive decline can play an equally detrimental role.

Alzheimer’s disease is the most common form of dementia, affecting more than 20 million people worldwide. Because patients may live for more than a decade after they are diagnosed with AD, it is the leading cause of disability in the elderly. AD is characterized by a neurotransmitter defect that involves acetylcholine. Because cholinergic function is required for short-term memory, this cholinergic deficit is thought to be responsible for much of the short-term memory deficit in AD. Consequently, many of the prescription drugs that exist for AD augment levels of acetylcholine in the brain to compensate for the loss of cholinergic function. However, as one group of researchers described, “Although some Food and Drug Administration-approved drugs are available for the treatment of Alzheimer’s disease, the outcomes are often unsatisfactory, and there is a place for alternative medicine, in particular, herbal medicine.”¹⁹

One herbal medicine frequently used as a cognitive enhancer is huperzine-A, derived from a particular type of club moss (*Huperzia serrata*). Three double-blind trials enrolling a total of more than 450 people indicated that huperzine-A can significantly improve symptoms of Alzheimer’s disease and other forms of dementia.²⁰⁻²²

Vinpocetine is another cognitive enhancer. It is derived from vincamine, a constituent of common periwinkle (*Vinca minor*). In a 16-week, double-blind, placebo-controlled trial of 203 people with mild to moderate dementia, vinpocetine produced significant benefit in the treated group.²³ Currently, researchers have undertaken additional trials to confirm these results.

Ginkgo biloba is perhaps the best known herbal memory enhancer. In several studies, ginkgo biloba has improved the symptoms and slowed the progression of Alzheimer’s disease. In a study of 309 patients with mild dementia, patients were given either 120 mg of ginkgo biloba

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CUSTOMERS' CORNER

by Ward Dean, MD
Medical Director

Bird Flu and Immune Optimizers

Dear Dr. Dean,

Preparation recommendations for an Avian or Bird Flu pandemic often include increasing one's level of immunity. But I have read that this H5N1 virus triggers too much of an immune response, in the form of a cytokine storm, which is the actual cause of death. Could you clarify this and do you have any recommendations? It seems that by the time symptoms are felt it is too late to stop the cytokine storm. Many thanks!

Ms. R.

Dear Ms. R.,

Several supplements that are erroneously, I believe, considered immune "stimulants" are actually immune normalizers, and act by enhancing the normal cytokine balance, thereby unregulating an immune system that is weakened, and down regulating an "overactive" immune system.

These three supplements are *Thymic Protein A*, *Beta Glucan*, and *EpiCor™*. I guess a better description of them would be "Immune Optimizers."

Another class of supplements to have on hand includes anti-viral substances such as *Mild Silver Protein* (MSP 400 ppm) and high-dose *Vitamin C*.

Ward Dean, M.D.

Fibrocystic Breast Disease

Dear Dr. Dean,

I recently read the *Vitamin Research News* article "Breast Health: Iodine & Other Nutrients Play a Crucial Role" by Dr. Flechas.

I am a 47-year-old female and I've had fibrocystic breast disease since I was 26 years old. I had a vaginal hysterectomy seven years ago (leaving the ovaries), with no problems. My concern is of course the recent reports and studies that have linked fibrocystic breast disease with breast cancer. I've

never been on any hormones or birth control pills and presently take daily vitamins, *Calcium* and extra *Folic Acid* and *Selenium*, and get yearly mammograms. I will start eating more green vegetables. My question is: Should I be taking a *Vitamin D* supplement and *Iodoral™* supplement to maintain healthy breast tissue? What is recommended for fibrocystic breast disease?

I plan on photo copying Dr. Flechas' article and giving it to my OB/GYN so he is aware of the current reports.

Thanks,
Ms. J.

Dear Ms. J.,

Considering your status as a long-term sufferer of FBD, I think it would be prudent for you to incorporate additional *Vitamin D* and *Iodoral* (iodine). Considering your age, it may also be time to start thinking of natural progesterone supplementation (*HerBalance™ Cream*), which may provide an additional layer of protection.

If you are having a hard time incorporating enough vegetables into your diet, you also may want to consider supplementing with *Primary Greens*.

Ward Dean, M.D.

Knee Injury

Dear Dr. Dean,

Could *Collagen Type II* or *Nutri-Joint* help my knee cartilage? It has a tear in the posterior horn of the medial meniscus. Doctors advise arthroscopy. I don't wish to lose 40 percent of it.

Mr. S.

Dear Mr. S.,

Nutri-Joint, with *Collagen Type II*, is designed to promote the replication of cartilage. I have had a number of patients whose torn menisci have healed on a regimen of the ingredients in *Nutri-Joint*.

Ward Dean, M.D.

Shin Splints

Dear Dr. Dean,

My husband suffers from shin splints. Do you have any suggestions?

Mrs. K.

Dear Mrs. K.,

Shin splints are a form of overuse injury. First, have him stop whatever activity he was engaged in that caused them in the first place, if possible. Next, have him get a pair of well-cushioned shoes that fit. Third, *Nutri-Joint Cream*, as an anti-inflammatory, may provide him significant relief, as well as speed his recovery. Finally, *UniZyme™* may enhance the anti-inflammatory effects of the *Nutri-Joint Cream*, and further accelerate his recovery.

Hope these suggestions are helpful.

Ward Dean, M.D.

Osteoporosis and Testosterone

Dear Dr. Dean,

I am currently taking what my doctor prescribed for osteoporosis—*Fosomax®* and *Calcium with Vitamin D*—along with *Advanced Essential Minerals, Strontium and Osteoflavone Complex*. Any other suggestions?

Thanks!
Ms. G.

Dear Ms. G.,

It looks as if you're on a pretty comprehensive program for osteoporosis. How is your testosterone? Low testosterone can be a major risk factor for osteoporosis. Also, I'd be interested in knowing your progesterone levels, as well.

If your testosterone is in the subnormal range, you can probably boost that with low-dose *DHEA*. Likewise, if your progesterone levels are in the low end, I suggest supplemental *HerBalance™ Cream*.

Ward Dean, M.D.

Blood Clot

Dear Dr. Dean,

My mother is taking *DMAE* 750 mg, *KandidaPlex™*, and *Huperzine*. She is 94 and a blood clot was found in her lung. She is taking Coumadin, will be on it for 6 months, and is stabilized in the hospital. I was going to order *Serrapeptase* for her. Will any of these products I mention interact with the Coumadin?

Ms. F.

Dear Ms. F.,

None of the products you mentioned will interact with the anti-coagulant effects of Coumadin, although *Serrapeptase* will help to prevent thrombi by other mechanisms, and may enable her to get by on a lower dose of Coumadin. I also recommend *Turmeric Extract* as a potent inhibitor of fibrinogen, the last clot-promoting factor in the blood-clotting cascade. Please let her physician know that she is on these products.

Also, you might pass along a copy of my article "Turmeric Reverses Fibrinogen – Spice Lowers Biomarker of Aging and Important Cardiovascular Risk Factor," available on our website.

Ward Dean, M.D.

Moles, Age Spots

Dear Dr. Dean,

Can you recommend a supplement that helps stop the skin from developing moles and/or other age defects?

Ms. G.

Dear Ms. G.,

DMAE will prevent the accumulation of lipofuscin, the cause of "age spots," and over the course of about six months, will cause "age spots" to disappear, particularly when used in higher dosage amounts.

I don't know of any nutritional regimen to prevent or treat moles. However, moles can develop into skin cancer. *Silymarin* and *Vitamin D3* are two supplements shown to protect the skin from sun damage and may therefore be of use. Please see the article "Skin Health: Nutritional Support for Ultra-violet Protection, Aging Skin, Rosacea, and Other Dermatological Concerns" available on our website.

Ward Dean, M.D.

Alopecia

Dear Dr. Dean,

I was reading in one of your articles on male hair loss that estrogen prevents the body from getting rid of DHT. Being female and taking natural hormones (estrogen and progesterone), do you think they are contributing to my alopecia?

Thank you.

Ms. B.

Dear Ms. B.,

I don't think I ever wrote that "estrogen prevents the body from getting rid of DHT," but DHT does have a follicle-killing effect, and testosterone can be converted to estrogen.

However, in women, I believe the most common hormonal causes of hair loss include hypothyroidism and excess conversion of adrenal hormones into testosterone. Iodine deficiency, as a cause of hypothyroidism, may be a secondary cause of hair loss.

Therefore, I suggest a *Salivary Hormone Test* of testosterone and cortisol, and an *Iodine Sufficiency Test*, to evaluate these possible causes of hair loss.

I don't think your natural hormones are contributing to the problem.

Ward Dean, M.D.

Motion Sickness

Dear Dr. Dean,

I am a 60-year-old student pilot. Although I enjoy the experience immensely, after an hour or so of touch-and-gos I feel foggy-headed, and it takes me a couple of days to recover. Why do I experience this, and what can I do to minimize this and/or recover from it more quickly?

With gratitude,
Mr. L.

Dear Mr. L.,

It sounds as if you are experiencing the after effects of motion sickness. As a former military flight surgeon, I had many patients present with similar symptoms as they were beginning their flight training.

The best remedy that I know is *Ginger Extract*, taken before and after flying. You might also try *Vinpocetine*, 40 mg per day.

Ward Dean, M.D.

SAD in an 11-Year-Old

Dear Dr. Dean,

Our 11-year-old son suddenly has been doing poorly in school. Once the season changed he has been hyper, not caring about schoolwork, etc. His grades have crashed quickly and he finally told me that he just can't remember anything, forgets the simplest things, and can't stay organized. I have dealt with seasonal affective disorder (SAD) since I was a kid and my husband is serotonin deficient. Could this be our son's problem?

We have him on *DMAE* 3 capsules in the a.m. and *DHA*. But this year it doesn't seem to be helping him. The difference from last year to this year is that he has played football this year and is going into basketball if he can get his grades up.

Would you suggest *5-HTP* and if so what dose? Is there anything else that can help him out of the fog of no concentration? You said that you have your boys eat every two hours for hypoglycemia. How do you work that in while they are in school?

Thank you.

Mrs. A.

Dear Mrs. A.,

5-HTP is a good idea, considering his genetic "heritage." I'd start with a nighttime dosage of 50 mg, and boost it every week or so by another 50 mg, until you notice improvement, up to a maximum dosage of about 200 mg. Although I don't recommend Melatonin, as a rule, for children, you might also try a low dose (750 mcg) at bedtime, instead of, or in addition to, the *5-HTP*.

At the time I gave the previous advice about my own children, I was home schooling them, so I had a bit of an advantage there.

Ward Dean, M.D.

Be sure to visit the dear doctor section at www.vrppet.com where you'll find questions and answers like these about your pets. You can also ask questions at dearvet@vrppet.com

Healthy Aging

Continued from page 7

extract or a placebo every day for up to a year.²⁴ At six months, 27 percent of those using ginkgo experienced moderate improvement on a variety of cognitive tests. In subjects taking the placebo, by contrast, only 14 percent experienced an improvement on the cognitive tests.

In addition, scientists have explored ginkgo's effects in conditions that may lead to dementia. In 112 patients with chronic cerebral insufficiency taking 120 mg/day of ginkgo significant improvements occurred in blood and oxygen flow.²⁵ Impaired blood and oxygen flow to the brain may be an important factor in the development of AD.

For best results, ginkgo should be taken consistently for at least 12 weeks.

Joint Health

Physical activity is a vital pre-condition for healthy aging and well-being. As we age, however, factors such as cartilage breakdown and osteoarthritis may interfere with our ability to lead an active life. Studies have shown that mental health and life satisfaction in seniors is related to the quality of their motor competence—the ability to “get around” on their own.²⁶

Osteoarthritis, a degenerative joint disease, is the most common type of arthritis and a leading cause of disability. Three of the most promising natural agents for improving joint health in osteoarthritis patients are glucosamine, chondroitin sulfate, and collagen type II (hyaluronic acid).

When used in combination, glucosamine and chondroitin have proved effective in patients with moderate to severe osteoarthritis knee pain. In a recent double-blind trial, researchers evaluated the efficacy and safety of a combination of glucosamine/chondroitin for knee pain from osteoarthritis. In the 24-week study, the researchers randomly assigned 1,583 patients with symptomatic knee osteoarthritis into five groups. One group received 1,500 mg of glucosamine per day, another group received 1,200 mg of chondroitin sulfate per day, a third group consumed both glucosamine and chondroitin sulfate, a fourth group consumed 200 mg of the

drug celecoxib per day, and a fifth group consumed a placebo for 24 weeks.

The results indicated that in the overall group of patients, the glucosamine/chondroitin combination worked only slightly better than the placebo. However, in the patients who suffered from moderate to severe knee pain glucosamine/chondroitin worked significantly better than the placebo. The rate of response in this group of patients was 79.2 percent in subjects taking the nutritional combination compared to only 54.3 percent in placebo-treated subjects.²⁷

In another study testing two different forms of glucosamine, 142 patients suffering from knee osteoarthritis experienced considerable improvement in osteoarthritis symptoms after four weeks of treatment. The patients experienced more than 90 percent improvement after taking glucosamine. The effect was so powerful that it persisted for two weeks after discontinuation of the supplements.²⁸

Interestingly, new research is beginning to suggest that glucosamine's effects on joint health may be due to its anti-inflammatory effects. In a cell culture study, researchers isolated chondrocytes (cartilage cells) from rats and cultured the cells with glucosamine. They then exposed the cells to IL-1 beta, which produces an inflammatory reaction. Glucosamine proved to be a potent, broad-spectrum inhibitor of IL-1beta. Glucosamine fully protected the chondrocytes from IL-1-induced expression of inflammatory cytokines, chemokines and growth factors as well as proteins involved in the synthesis of prostaglandin (PGE2) and nitric oxide, two other inflammatory substances.²⁹

According to the study authors, the results suggest “that the potential benefit of glucosamine in osteoarthritis is not related to cartilage matrix biosynthesis, but more likely to its ability to globally inhibit the deleterious effects of IL-1beta.”

Hyaluronic acid (collagen type II) is another joint-supporting substance thought to have beneficial effects on chondrocytes. Hyaluronic acid is incorporated into articular cartilage where it may have a direct biological effect on chondrocytes. In vitro, hyaluronic acid significantly increases factors involved in the building of cartilage, such as increasing DNA, glycosaminoglycans (substances that help form the

connective tissue of skin, tendons, cartilage, ligaments and bone matrix) and hydroxyproline synthesis and increasing matrix deposition of chondroitin-6-sulphate and collagen type II.³⁰

“These findings confirm a stimulatory effect of hyaluronic acid on chondrocyte metabolism,” the study authors wrote.

HA has high daily turnover and levels decline with aging, so large amounts may be needed to maintain normal steady-state levels.

Vision

Preserving sight during the aging process is critical to leading a healthy, active life. Macular degeneration, a chronic, progressive eye disease, is the leading cause of blindness in older Americans. Two other eye conditions of concern to the aging population are cataracts (which also are one of the major causes of blindness throughout the world) and glaucoma.

Researchers have investigated a number of nutrients for their ability to maintain eye health. Lipoic acid has been shown to stop the formation of cataracts in diabetic rats, possibly due to its concomitant glucose-lowering ability.³¹

Lutein and zeaxanthin also are involved in eye health. Although consumption of these two carotenoids is best known for the reduced risk of age-related macular degeneration (ARMD), studies also are now linking their consumption to a reduced risk of cataracts. One group of researchers studied 899 subjects and determined that the highest levels of plasma zeaxanthin was significantly associated with reduced risk of ARMD, nuclear cataract and any cataract. The highest combined plasma lutein and zeaxanthin levels were significantly associated with a reduced risk of ARMD.³²

Taurine, N-acetyl cysteine and grape seed extract are three other nutrients that play an important role in eye health. Animals with primary glaucoma experience ischemia-like losses of taurine in the photoreceptors of their eyes, especially in damaged regions, leading researchers to conclude that this depletion perhaps contributes to progressive damage in these areas.³³

Vitamin B6 and NAC supplementation may be helpful in slowing the oxidation of lens proteins that occurs after high glucose blood concentrations.³⁴

In rodents bred to develop cataracts, procyanidin-rich grape seed extract significantly prevented and postponed development of cataract formation. The grape seed extract also reduced concentration of malondialdehyde, a harmful marker of free radical damage, in the eye lens.³⁵

According to the researchers, "These results suggested that procyanidins and their antioxidative metabolites prevented the progression of cataract formation by their antioxidative action."

Conclusion

Although I've separately addressed each of these five components of healthy aging, they are all tied together and improving one factor may lead to improvements in other areas. Blood sugar control can help improve vision and heart health. Improvements in joint health can lead to more time spent exercising, thereby improving the cardiovascular system. Consequently, taking steps now in each of these five specific areas can preserve our overall general health and our active lifestyle as we age.

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Customers' Corner Supplement Index

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Introducing Vitamin Research Products' Chief Science Officer, Jeffrey Reinhardt, MSc

by VRP Staff

Vitamin Research Products places a great deal of importance on the science behind our nutritional supplement formulas. Consequently, a recent addition to our team is Jeffrey Reinhardt, who will serve as our Chief Science Officer. In this position Jeffrey will help us to continue to compile the most up-to-date nutritional information available and to develop innovative new formulas and products. We thought you would enjoy meeting Jeffrey through this interview and learn how his immense background in the dietary supplement and health litigation industries will benefit VRP customers.

VRP: You have quite a diverse background that includes academic, industrial and military research and development.

JR: Yes. I am very fortunate to have been able to devote my life to science by performing interesting research for a variety of different entities. From the beginning, I've had a hunger for scientific knowledge. I obtained my undergraduate degree from Rutgers University, majoring in chemistry and pre-med. After five years in graduate school studying biochemistry and microbiology at Rutgers, I served as a Captain in the U.S. Army Medical Research and Development Command at the Letterman Army Institute of Research in San Francisco from 1969 – 1972. That was a fascinating assignment; one of my responsibilities was directing a multidisciplinary research program investigating tropical infectious diseases in military personnel.

VRP: Didn't you win an award for your work at the Letterman Army Institute?

JR: Yes, my colleagues and I were awarded the American Academy of Dermatology's Gold Medal Award for Original Research in 1972, for defining the roles of environmental stresses and immune mechanisms on the susceptibility to skin diseases in Viet Nam.

VRP: From reading your curriculum vitae, it seems as if you also have exten-

sive background in legal matters and regulatory affairs. Tell us more about this background.

JR: Certainly. I have worked with many law firms as a consultant for various regulatory issues and patent litigation. For example, I have served as the scientific consultant for a Federal Trade Commission (FTC) Administrative Action; as a case development consultant and expert witness for a polychlorinated biphenyl (PCB) wrongful death case; and as a case management consultant on a personal injury case (Microwave Radiation Injury). My experience as a consultant for health regulatory issues spans nearly three decades. This extensive involvement in health litigation and my familiarity with the FTC will help VRP interpret the subtleties of nutritional supplement advertising, and provide guidance with understanding of the many FDA regulatory issues including the intricacies of DSHEA (Dietary Supplement Health Education Act) plus to how best to implement good manufacturing practices (GMP's). This will continue to ensure VRP offers "best of category" products that are safe and effective.

VRP: You've also been involved in product development.

JR: One of my passions has been formulating natural products and dietary supplements. I've devoted a great deal of time to the development of innovative, nutraceutical products for more than twenty years. I enjoy creating new products that act synergistically to enhance key biochemical mechanisms and support important physiologic functions.

A special interest of mine has been to study healing traditions around the planet to identify safe and effective botanicals. Studying these cultural healing traditions, enables me to delve into the research and mechanisms of action underlying the healing herbs and their phytochemicals using the Western scientific analytic methods. This allows us at VRP to identify and develop state-of-the-art new product

formulations and to procure the highest quality ingredients available commercially. Proceeding in this way, we can continue to develop 'best in category' products which support a high level of wellness.

VRP: As Chief Science Officer, you will no doubt be involved in formulating new products. What other responsibilities are included in this new position?

JR: In this age of information overload, it's important to have a trained scientist read and understand the vast scope of research being published. This will allow VRP to compile all of the credible, new published research as well as the research presented in Nutraceutical industry meetings and various nutrition societies. Together with my colleagues in the research and development department, I review Internet publications, read journals and text books, and make frequent visits to the US Patent and Trademark office's website to learn about both new patent applications and patents recently awarded. If you could see my desk and the adjoining desks, you would see many piles of papers and books.

In addition, several times a day, we conduct database searches of the sites that store medical journal abstracts. I also attend trade shows, seminars and lectures and interact with raw material manufacturers and suppliers.

We then digest all of the credible research relevant to human health, such as nutrition, metabolism, bioenergetics or ATP production, endurance and vitality, longevity, performance, cognition and many other important areas so that we can thoroughly understand the new research breakthroughs, including the recently discovered mechanisms of action of key nutrients, as well as accessory nutrients, nutritional biochemicals and phytochemicals. After we assimilate and digest all of this research, we can then communicate it to clinicians and consumers alike, giving them the benefit of up-to-date knowledge to make the best choices for their health.

CoQ10-H₂

Continued from page 5

larly the highly reactive hydroxyl radical (OH \cdot) and the superoxide radical (O $_2$ \cdot^-) in the lipid membranes of cells and their mitochondria.

Until recently, the oxidized form of CoenzymeQ10, CoQ10-Ox, has been the only form of this widely used nutraceutical available. As mentioned above, its applications have been well documented. Now, CoQ10-H₂, a potent, new reduced form of oral CoenzymeQ10 is available in fifty milligram (50 mg.) soft gelatin capsules.

CoQ10-H₂ is significantly more bioavailable than the oxidized form, CoQ10-Ox; in addition, CoQ10-H₂, produces sustained, elevated blood levels of total CoenzymeQ10, at lower dosages. Fifty milligrams (50 mg.) of CoQ10-H₂ yields improved blood levels, which produce the prolonged bioenergetic and antioxidant benefits.

A recently published single-blind, placebo controlled, four-week study of healthy Japanese subjects has shown that CoQ10-H₂ was absorbed rapidly and efficiently from the gastrointestinal tract after oral administration of ubiquinol, the reduced form of CoenzymeQ10. The Japanese researchers reported that the benefits of reduced CoenzymeQ10,

CoQ10-H₂, were attributable to the over 210 percent increase in blood levels of ubiquinol; this is a dramatic and therapeutically efficacious elevation when compared to ubiquinone, the oxidized form of CoenzymeQ10. Importantly, this study also revealed no abnormal laboratory values seen in blood chemistry panels or any other indications of clinically relevant safety concerns, as evidenced by the clinicians' assessments of adverse events related to dosages of CoQ10-H₂ up to 300 mg. per day.¹⁰

Conclusion

The documented role of CoQ10-H₂ in the synthesis of adenosine triphosphate (ATP) by mitochondria in both cardiac and skeletal muscle provides a solid bioenergetic foundation for the clinically anticipated benefits of increased cardiac output leading to improved stamina and endurance. The improved antioxidant protection of cellular and mitochondrial membranes achieved with CoQ10-H₂, plus the protection of mitochondrial DNA from reactive oxidant stresses (ROS) makes CoQ10-H₂ the preferred choice for health conscious consumers plus physicians and nutritionists, who are working with their heart disease patients to achieve improved cardiac function and circulation, which correlates with renewed vitality and longevity. The superior bioavailability of

CoQ10-H₂ also will prove advantageous to anyone who wants to increase their energy levels or address any of the concerns mentioned in this article.

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PET CORNER

By Gary L. Ailes, DVM

Helping Animals Achieve a Healthy Weight

After the holidays, one of the main concerns in humans is weight loss. The same concerns exist for our pets. After all, all those treats that accidentally fell on the floor are as detrimental to our pets' waistlines as they were to us before they ended up as a bonus for our best friends.

We are continually reading headlines about the obesity epidemic in the United States. This epidemic also exists in many of our pets. This excess weight strongly relates to how good our

pets feel, how well they can walk, run and play, what their general attitude is and how long they live. Research has proved that puppies raised on minimal calories with a complete balanced dog food have fewer problems with hip dysplasia and other skeletal problems.

In my own veterinary practice, I have seen examples of what excess weight can do to an animal. I am currently working with a dog that weighs 97 pounds and carries that weight on a 60-pound frame. That is roughly equivalent to a 200-pound man

weighing in at 300 pounds. For those of us who would like our pets to live as long and wonderful a life as possible, it is time to take steps to help our animals maintain a healthy weight.

First, have your veterinarian do a full physical exam and lab work which should include blood chemistries, thyroid test and urinalysis.

To read the rest of this article please go to www.vrppet.com

Selenium and Vitamins B6 and B12 Levels Linked to Active Life in Seniors

A new study indicates that women who have high serum concentrations of selenium and vitamins B6 and B12 have a significantly reduced risk of age-related disability in conducting daily activities, leading researchers to suggest that nutritional status is an important factor in helping the elderly live an active life longer.

Researchers studied whether low concentrations of select nutrients predicted the development and course of disability. The study included community-dwelling women 65 years or older enrolled in the Women's Health and Aging Study I. In total, 643 women were assessed at 6-month intervals from 1992 to 1995. In those three years of follow-up, the study authors determined the subjects' incidence rates of disability in activities of daily living. The researchers defined disability in activities of daily living as self-reported difficulty in performing two or more activities such as bathing, dressing, toileting, and eating.

Women with the lowest serum concentrations of vitamin B6, vitamin B12, and selenium had a significantly higher risk of disability in activities of daily living compared with women with the highest serum concentrations of the nutrients. Women with the lowest vitamin B6 levels had a 17.3 percent incidence rate of disabilities compared with 12.8 percent for those with the highest levels. Women with the lowest levels of vitamin B12 had a 16.7 percent rate of incidence for disabilities compared to 12 percent in subjects with the highest levels while women with the lowest selenium levels had 21.6 percent disability rate compared to 10.8 percent for individuals with the highest levels.

The scientists pointed out that oxidative stress may lead to disability through dysregulation of cellular function and up-regulation of proinflammatory cytokines, muscle and neuronal damage, and

the exacerbation of degenerative diseases. Consequently, the researchers theorized that selenium may exert its protective effect through its ability to act as an antioxidant.

In addition, vitamins B6 and B12 may help prevent disabilities through their role in reducing homocysteine levels, the researchers suggested.

The study authors concluded, "Low serum concentrations of vitamins B6 and B12 and selenium predict subsequent disability in activities of daily living in older women living in the community. Nutritional status is one of the key factors to be considered in the development of strategies aimed at preventing or delaying the disablement process."

Reference:

Bartali B, Semba RD, Frongillo EA, Varadhan R, Ricks MO, Blaum CS, Ferrucci L, Guralnik JM, Fried LP. Low micronutrient levels as a predictor of incident disability in older women. *Arch Intern Med.* 2006 Nov 27;166(21):2335-40.

Turmeric Component Linked to Cognitive Health

Individuals who frequently consume curcumin, the yellow pigment in turmeric, have better cognitive performance than people who don't consume the spice, a new epidemiological study has found.

Curcumin has been shown to possess potent antioxidant and anti-inflammatory properties and to reduce the beta-amyloid and plaque build-up thought to be responsible for Alzheimer's disease. In addition, in India, where curry consumption is common, the prevalence of Alzheimer's disease among the elderly between 70 and 79 years of age is four-fold less than that of the United States.

The authors of the current study investigated the association between curry consumption and cognitive function in elderly Asians. The researchers studied 1,010 elderly Asian subjects aged 60-93 years who did not suffer from dementia at the study's start in 2003. The researchers compared Mini-Mental State Examination (MMSE) scores for three categories of regular curry consumption.

The results indicated that those who consumed curry "occasionally" and "often or very often" had significantly better mental performance scores than did subjects who "never or rarely" consumed curry. The study authors calculated that curcumin consumption could reduce the risk of developing dementia by 49 percent in people who consume it "often or very often." Consuming curcumin "occasionally" could lead to a 38 percent reduced risk, the researchers concluded.

According to the researchers, "These findings present the first epidemiological evidence supporting a link between curry consumption and cognitive performance that was suggested by a large number of earlier experimental evidence."

Other researchers have cautioned that because curry dishes in the west are high in fat, consuming curcumin/turmeric in supplement form may be preferable to receiving the spice from the diet.

Reference:

Ng TP, Chiam PC, Lee T, Chua HC, Lim L, Kua EH. Curry consumption and cognitive function in the elderly. *Am J Epidemiol.* 2006 Nov 1;164(9):898-906.

Probiotics and Prebiotics Support Health of Infants with Eczema

A new study confirms an abundance of past research that suggests giving newborns a combination of probiotics and prebiotics significantly reduces the incidence of eczema in high-risk children.

Eczema is also known as atopic dermatitis. It is one of the first signs of allergy in newborns. According to the American Academy of Dermatologists, 10 to 20 percent of all infants develop eczema, but almost half of them will outgrow the condition before they reach age 15.

In the current study, researchers studied the effect on allergic diseases of a mixture of 4 probiotic bacterial strains (*Lactobacillus rhamnosus* GG, *L rhamnosus* LC705, *Bifidobacterium breve* Bb99, and *Propionibacterium freudenreichii* ssp. *shermanii* JS) along with the prebiotic known as galacto-oligosaccharides. They

randomized 1,223 pregnant women carrying children at high risk to develop an allergic disease into two groups: one group of women used a probiotic preparation while another group received a placebo for 2 to 4 weeks before delivery. After birth, 461 of their infants received the same probiotics plus galacto-oligosaccharides while 464 received a placebo.

At 2 years, the study authors evaluated the cumulative incidence of allergic diseases (food allergy, eczema, asthma, and allergic rhinitis). The results indicate that although probiotic treatment compared with placebo showed no effect on the cumulative incidence of allergic diseases, it did significantly reduce the incidence of eczema by 26 percent and atopic eczema by 34 percent. In addition, the Lactobacilli and bifidobacteria more frequently colonized the guts of supplemented infants compared to the other strains tested.

The researchers concluded, "The results suggest an inverse association between atopic diseases and colonization of the gut by probiotics. The prevention of atopic eczema in high-risk infants is possible by modulating the infant's gut microbiota with probiotics and prebiotics."

Reference:

Kukkonen K, Savilahti E, Haahtela T, Juntunen-Backman K, Korpela R, Poussa T, Tuure T, Kuitunen M. Probiotics and prebiotic galacto-oligosaccharides in the prevention of allergic diseases: A randomized, double-blind, placebo-controlled trial. *Journal of Allergy & Clinical Immunology*. Published online ahead of print on October 27, 2006.

Omega-3 Fatty Acids Improve Sense of Well-Being

A new review of the medical literature by Australian scientists has found that omega-3 fatty acids are effective in alleviating depression.

University of Sydney scientists analyzed the medical literature in order to determine how dietary manipulation might alleviate depression's effects. They looked at studies that investigated potential mood-boosting effects of natural substances such as omega-3 fatty acids, folate, tryptophan, vitamins B6 and B12, S-adenosyl-L-methionine (SAME) and St. John's wort.

After studying 103 sources, the reviewers concluded that omega-3 fatty acids offer the most hope in terms of nutritional support for depression. In reviewing a number of epidemiological data, the researchers pointed to the smaller relative occurrence of depression in certain communities or populations that consume a lot of fish.

"A review of epidemiological data suggests that there is a link between depression and fish consumption, and although it is true that correlation is not causation, there is evidence that fish and fish oils may be protective against depression," wrote the study's lead author, Dianne Volker.

According to the study, compared to other nutrients investigated for their effects on depression, omega-3 fatty acids carried significantly more evidence in the literature.

The study authors suggested that the mechanism of action behind fish oil's mood-boosting role could be related to the membrane lipid abnormalities thought to occur in depression because omega-3s, particularly DHA, are depleted in depressed subjects.

The reviewers concluded, "Evidence reviewed supports a potential therapeutic benefit of n-3 [omega-3] polyunsaturated fatty acids for the alleviation of negative symptoms associated with depression. Omega-3 polyunsaturated fatty acids, optimal omega balance, folate, tryptophan, vitamin B6, B12, S-adenosyl-L-methionine and *Hypericum perforatum* [St. John's wort] may all serve as adjuncts to psychosocial and pharmacological therapies, with positive implications for long-term prognosis."

Because the majority of evidence on the reduced risk of depression in people who consume omega-3s is predominantly epidemiological, the reviewers called for more clinical experimental data to confirm their observations.

Reference:

Volker D, Ng J. Depression: Does nutrition have an adjunctive treatment role? *Nutrition & Dietetics*. 2006 December; 63(4):213.

Magnesium Improves Bone Health in Girls

Magnesium oxide supplements increase hip bone mineral content in girls, a new study has found.

Past studies indicate that dietary magnesium intake and bone mineral density are correlated in adults, but, until now, no data from interventional studies in children and adolescents are available. Consequently, the authors of the current study sought to determine if magnesium supplementation in peri-adolescent girls enhances bone mass.

In the placebo-controlled, randomized, double-blind trial, healthy 8- to 14-year-old Caucasian girls were recruited from community pediatricians' offices. Dietary diaries from more than 120 volunteers were analyzed and those with dietary magnesium intake of less than 220 mg per day were invited to participate in the study.

The subjects were given 300 mg of oral elemental magnesium per day in 2 divided doses or placebo for 12 months. The scientists then measured the effect of magnesium on bone mineral content (BMC) in a number of areas including total hip, femoral neck, and lumbar spine.

The results indicate that magnesium supplementation significantly increased hip bone mineral content in the pre- and early puberty group and in the mid to late puberty group. Researchers found that the subjects had an excellent compliance rate.

The researchers concluded, "Oral magnesium oxide capsules are safe and well-tolerated. A positive effect of Mg supplementation on integrated hip BMC was evident in this small cohort."

Reference:

Carpenter TO, Delucia MC, Zhang JH, Bejnerowicz G, Tartamella L, Dziura J, Petersen KF, Befroy D, Cohen D. A randomized controlled study of effects of dietary magnesium oxide supplementation on bone mineral content in healthy girls. *J Clin Endocrinol Metab*. 2006 Oct 3; [Epub ahead of print].

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