

High ORAC Synbiotic Formula

Monograph

The Philosophy

Complex chronic diseases are a mounting problem worldwide with many factors giving rise to a pandemic concern. Pollution, life style choices, stress levels, dietary patterns, globalization and virulent pathogens have collectively weakened our immune systems. The major “Port-of-Entry” for these xenobiotics and pathogens is our GI tract, with one cell-layer of mucous membrane as the barrier that separates and protects us. Our body focuses its defense, communication and intelligence at this one-celled mucous membrane.

The High ORAC Synbiotic Formula is a part of a powerful range of Therapeutic Foods Synbiotic Formulas designed specifically to protect the integrity and functionality of the gastrointestinal system. The pedigreed Original Probiotic mix and the Therapeutic Foods chosen for the High ORAC Formula bring to life a magnitude of scientifically researched medicinal applications.

Properties

Each capsule provides:

- 25 billion of the Original probiotic organisms: *Lactobacillus acidophilus* (ATCC 4356) and *Bifidobacteria longum* (ATCC 15707).
- 250 mg of a freeze-dried berry extract and fruit blend providing 1500 ORAC units: Wild Blueberry Extract, Grape and Grape Seed Extract, Raspberry and Raspberry Seed Extract, Cranberry, Tart Cherry, Prune and Wild Bilberry Extract.
- 250 mg of inulin from chicory fiber.

Technological Attributes

Microbiome Technology

Therapeutic Foods bacterial cultures are produced by the Microbiome Technology; a proprietary system that begins by feeding the bacteria with a strain-specific media (special food) to stimulate accelerated cell division. The optimal nutritional profile of these media guarantees cells that are compact and have significantly stronger and thicker cell walls. These physical characteristics result in greatly increased viability and full potential for genomic expression for each probiotic organism. Dry Preservation Technology maintains ultra-low moisture content and ensures longer shelf life. Every batch is confirmed routinely by DNA sequencing to their original molecular identity from the ATCC Depository at Georgetown University and the Gene Bank in Bethesda, Maryland.

ORAC- Oxygen Radical Absorbing Capacity

The scientific standard for measuring the anti free radical potency of foods is currently expressed in ORAC units. The ORAC assay has been extensively utilized in the field of oxidative medical research. It gives science the ability to quantify total antioxidant strength of any food, tissue or fluid. Simply explained, a high ORAC score indicates a high total antioxidant capacity.

Clinical Applications

The Original Probiotic strain

The Original strains selected of *Bifidobacterium* and *Lactobacillus* organisms are ATCC prototypes with their molecular identity confirmed routinely to provide the highest quality and functionality of the organisms. The organisms have 40 years of proven ability to successfully pass through stomach acid and GI tract bile, and effectively colonize and protect the mucous membrane through their abilities to protect, counteract and neutralize dietary toxin, mutagen, carcinogens and infectious organisms. A detailed discussion of the Original probiotic bacterial organisms chosen for the High ORAC Formula is found in the BioImmersion Web Library; Original Synbiotic Formula monograph and brief.

High ORAC Anti-Aging

The fastest growing segment of the United States population is age 65 years and older. At current rates, demographers forecast that by the year 2025, 65 year olds will outnumber teenagers by almost 2 to 1. Most diseases associated with the human aging process are known to have a strong oxidative stress component. Therapies that act to lower oxidative stress represent a major approach in treating these diseases as well as intervening with the aging process itself

Oxidative stress is a general term used to describe steady state level of oxidative damage in a cell, tissue or organ caused by free radicals. Free radicals are reactive molecules (ROS) within our bodies that can attack proteins, lipids, and DNA causing damage to these macromolecules resulting in cell damage and cell death, and the generation of even more highly reactive free radicals. An extensive, highly effective group of protective agents and defense mechanisms referred to collectively as the Antioxidant Defense system (ADS) acts to regulate oxidative reactions. These include endogenous antioxidants such as superoxide dismutase (SOD), catalase and glutathione peroxidase (GPx) to exogenous antioxidants such as Vitamin C, E, lipoic acid, Coenzyme Q10 and powerful groups of phytonutrients derived from vegetables and fruits such as terpenes, phytosterols, polyphenols, thiols, indoles, isoprenoids, tocotrienol and tocopherols.

The High ORAC is a concentrated blend of the polyphenol group: anthocyanins, chlorogenic acid, proanthocyanins, ellagic acid, quinic acid and resveratrol. The phenolics work together with the original probiotic strains to reduce the free radical load and lower oxidative stress, slowing down and even regressing the aging process. The Original probiotic bacteria were selected for their ability to produce enzymes that can neutralize and transform free radicals into safe compounds. The High ORAC antioxidant power of each berry and fruit in ORAC units per gram: Wild Blueberry Extract- 3500 ORAC units, Grape and Grape Seed Extract- 14,000 ORAC units, Raspberry and Raspberry Seed Extract- 300 ORAC units, Cranberry- 300 ORAC units, Tart Cherry- 100 ORAC units, Prune- 100 ORAC units, Wild Bilberry Extract- 3000 ORAC units.

The government slogan of 5-A-Day is for the consistent consumption of five fruits and vegetables a day supplying an average ORAC value of 2500 ORAC units. The reality is that only 5% of the U.S. population consumes 5 fruits and vegetables a day. The National Cancer Institute found that 42% of the population eats less than 2 servings a day. The average American serving per day can be as low as 300 ORAC units. The High ORAC provides 1500 ORAC units per 500mg capsule.

Antioxidant Effect

Evidence shows that plant antioxidants seem to acquire a synergy when they are ingested in combination. It is better to have a whole orchestra of antioxidants in natural proportions as delivered in the matrix of a whole food.

The antioxidant power of the **Wild Blueberry extract** comes from two main sources: one is chlorogenic acid, found in large quantities, and the other is the anthocyanin pigment that gives blueberries their intense color. **Most fruits contain 3 to 4 types of anthocyanins, while wild blueberries offer 25 to 30.** The blueberry extract concentrates both the anthocyanins and the chlorogenic acid. Wild blueberry extract is well researched for its regenerative benefits. The wild blueberry reverses brain aging, restores memory and repairs and regenerates neurons.

Grapes and grape seed extract are on par with blueberries in anthocyanin content. **Recent analyses are showing up to 31 types of anthocyanins.** Grape and Grape seed reduce the risk of oxLDL. When platelets begin to aggregate they produce superoxide molecules, a dangerous free radical that oxidizes LDL. Grape and grape seed turn down the activity of platelets, reducing their ability to clump. Arteries need to expand in response to increased blood flow. The flavonoids in grapes help to keep arteries elastic, delivering enough oxygen and nutrients to the brain, muscles, and other organs. Recent research has shown **Resveratrol**, a phenolic compound found largely in the skins of red grapes, to be a potent antioxidant and is being touted by wine manufacturers as a possible explanation for the "French Paradox"- the low incidence of heart disease among the French people, who eat a relatively high fat diet. Most fruits and vegetables have one or two groups of phenolics in high quantities, grapes have an encyclopedia worth.

Raspberry and raspberry seed extract are one of the top antioxidant foods. **Raspberries are shown to contain high amounts of ellagic acid**, a phenolic acid with high antioxidant capacity. Ellagic acid has been shown to prevent esophageal and colon tumors in animals. Ellagic acid neutralizes problematic phase one enzymes and boosts detoxifying phase two enzymes. Biologist Gary Stoner, chair of environmental health sciences at the School of Public Health at Ohio State University, explains that ellagic acid regulates the levels of two crucial sets of enzymes; the phase 1 liver enzymes help cells convert foods into forms the body can use. These enzymes also take a certain number of harmless substances and transform them into carcinogens. Phase 2 enzymes detoxify these carcinogens by attaching the toxin to a soluble compound in the cell, then dumping it into the blood to be cleared away. As long as there is more phase 2 enzymes than phase 1 enzymes, the body is protected. In addition to regulating these enzymes ellagic acid encourages apoptosis. Cells are programmed to die at a certain age or to self-destruct if they develop abnormally. Cancer cells on the other hand continue to multiply.

According to Dr. Daniel Nixon, a medical oncologist and president of the American Health Foundation, ellagic acid makes cancer cells learn how to die like normal cells.

Wild Bilberry, a European relative of the blueberry, emerged as a herbal medicine in the Middle Ages utilized by Saint Hildegard of Bingen (1098-1179), a German nun, and the first woman to write an herbal. **Its effectiveness is linked to the dark blue pigments (the anthocyanins) to which the extract concentrates 25%.** Like the blueberry it confers anti-oxidative, anti-inflammatory and antimicrobial benefits. The German Commission E has produced a positive monograph on bilberry fruits, which are allowed for the treatment of acute diarrhea, and for treatment of inflammation of the GI mucous membrane. One of the most important uses of bilberry relates to conditions of peripheral vascular disorders, especially those involving capillary fragility. These tiny blood vessels become fragile, common in aging populations. Weak capillaries are associated with poor blood circulation to connective tissue and have been related to inflammatory conditions such as arthritis. Bilberry anthocyanins serve to strengthen capillaries by protecting them from free radical damage. They also stimulate the formation of new capillaries. Results of

clinical studies involving more than 700 patients with various conditions related to poor microcirculation such as atherosclerosis, tendencies toward bruising, hemorrhoids and varicose veins have shown the wild bilberry extract helps reduce damage from free radicals and promote healthy circulation to the extremities. These studies involved extracts of fruits standardized to contain 25% anthocyanins.

Cranberry polyphenols have shown potent anti-inflammatory, antimicrobial and anti-oxidative activities. **Cranberries are rich in benzoic acid**, which has a strong antioxidant effect.

Prunes are dried and therefore the antioxidants are concentrated. **A serving of 5 prunes gives an ORAC score of 5,770.**

Anti-inflammatory

Inflammation is not necessarily a “bad thing”. In fact, it is the body first defense response against infection, injury and general stress. However, when the inflammatory response goes awry it can lead to heart attacks, colon cancer, Alzheimer’s and a host of other diseases. Chronic inflammation has become an important focus of medical research today with studies that continually uncover new ways chronic inflammation harms the body.

In the Czech Republic medical researchers are looking at the aging process in relation to the supply of stem cells in our bodies that are obtainable to use throughout our life span. The inflammatory process (good or bad) inevitably causes tissue damage and that stimulates the body repair mechanism to use stem cells for repair. **Chronic inflammation of any kind creates an on going process of recruiting stem cells to repair. This mechanism continually draws on our finite supply and over a time our stem cells pool is diminished causing our bodies to age faster.** It has been predicted that 21st century generation of children will have shorter life spans than their parents because of the augmented levels of chronic inflammation in their bodies.

Pro-inflammatory conditions in the GI tract and systemically are mediated by pro-inflammatory cytokines and chemokines. **The anti-inflammatory power of the**

High ORAC synbiotic Formula has shown in studies strong abilities to reduce important markers of inflammation.

Lactobacillus acidophilus has a demonstrated ability to reduce NF kappa Beta levels and *Bifidobacterium longum* to reduce interleukin-8 a proinflammatory chemokine. NF kappa Beta is a transcription molecule that initiates the production of pro-inflammatory cytokines and chemokines. Reducing the NF kappa B levels down- regulates inflammation throughout the whole body. The Isoprostanes biological marker signifies lipid oxidation caused by pro-inflammatory prostaglandin cascades mediated by COX-2.

The **Wild Blueberry extract** in the high ORAC formula reduces NF kappa Beta and isoprostane levels thereby down-regulating the inflammatory response. COX-2 is over-expressed in a wide variety of neoplasias such as colorectal, gastric, liver, pancreas, esophagus, lung, skin, breast, bladder and prostate levels in vivo. The wild blueberry has been found to be a potent COX-2 inhibitor in vitro.

In recent studies **Tart Cherry** exhibit strong anti-inflammatory results.

Muraleedharan Nair, professor of natural product chemistry at Michigan State University, put these anthocyanins into a test tube along with enzymes that cause inflammation and watched to see if the pigments would block the action of enzymes. They did. **The anthocyanins in Tart Cherry worked just as well as aspirin and ibuprofen.** It is important to note that tart cherry has a strong historical use for pain relief with arthritis (including gout) and with consistent use has shown to work as well as drug treatments.

Antimicrobial

The High ORAC berries and fruit work synergistically with the Original strain bacteria as a powerful broad spectrum antimicrobial. In general, berry extracts inhibit the growth of gram-negative but not gram-positive bacteria. Since the beneficial lactic acid organisms are gram positive they are not harmed by the antimicrobial properties of the berries.

It has been demonstrated in studies that whole **Raspberries** were able to cause significant inhibition of bacterial growth. In particular they were effective against *Staphylococcus aureus* and *Escherichia coli*. The antibacterial nature of raspberry

may make it suitable for purification of contaminated water sources and as well as a general health tonic. The main phenolic compound in raspberry fruits is ellagic acid (88% of all phenolics). In a study in the Journal of Medicinal Food Vol. 6 Number 1, 2003, six different concentrations of raspberry cordials, (along with blackberry and blackberry cordials) were evaluated for antibacterial activity. The following bacteria, with different cell structure and biochemistry, were chosen: *Alcaligenes faecalis*, *Clostridium perfringens*, *Enterococcus faecalis*, *E. coli*, *Mycobacterium phlie*, *Pseudomonas aeruginosa*, *Salmonella californica*, *Salmonella enteritidis*, *Salmonella typhimurium*, *Shigella sonnei*, *S. aureus*, and methicillin-resistant *S. aureus* (MRSA). The yeast *C. albicans* was also included. Three of the six raspberry cordials completely inhibited all 12 bacteria and *C. albicans* at dilutions of 1:5. Differences in levels of ellagic acid and other phenolics in raspberries may contribute to the varying antibacterial activity. An important note: The Infectious Diseases Society of America, an association of 8,000 infection disease specialists announced MRSA as one of the 6 most dangerous organisms in medicine today.

Cranberry anti-adhesive activity against food borne pathogens and adhesive *E. coli* bacteria such as those causing UTI is well established. Amy Howell, a research scientist at the Rutgers University discovered that cranberries have a group of larger molecules called A-linked condensed tannins. These members of the polyphenolic family act like a Teflon coating to prevent *E. coli* bacteria from adhering to the walls of the bladder and urethra. Research out of the University of California, Irvine, suggests that cranberry juice can fight other types of bacteria, including staph and salmonella infections. Scientists at Tel Aviv University have found that cranberry can prevent ulcer causing *H. pylori* from adhering to the stomach lining.

Wild blueberries have also shown to prevent urinary tract infections. This effect is not due to the highly acidic nature of blueberries as was thought to be, but instead to the specific compounds that inhibit the adherence of *E. coli* bacteria to uroepithelial cells.

Resveratrol is a remarkable member of the polyphenos. It is produced in grapes in response to trauma including fungal, viral and bacterial infections. Recent studies by researchers from the Institute of Neurobiology and Molecular Medicine of the Italian

Research Council in Rome showed that resveratrol blocks influenza A virus replication both in vitro and in flu-infected mice. Resveratrol inhibits the replication of Herpes simplex virus types 1 and 2 in a dose-dependent, reversible manner. In brain tissue, resveratrol inhibits the reactivation of viruses from infected neurons. In addition, resveratrol has been found to synergistically enhance the effects of known anti-HIV drugs. Resveratrol is a phytoalexin, a class of antibiotic compounds produced as a part of a plants defense system, especially against phytopathogenic fungi.

Neuro-Regenerative

The enteric nervous system (ENS) of the GI tract is called the “second brain” and is second to the brain in neural tissue mass. It has a vast chemical warehouse within which is represented every one of the classes of neurotransmitter found in the brain. Neurotransmitters are the words nerve cells use for communication with one another and with the cells under their control. **The multiplicity of neurotransmitters in the bowel suggests that the language spoken by the cells of the enteric nervous system is rich and brain-like in its complexity.** The ENS can influence the CNS both through nerve reflexes and the production of neuropeptides. A chronically inflamed GI tract with unchecked levels of oxidative stress leads to damage of the enteric nervous tissue resulting in impaired GI tract functions such as peristalsis, blood flow, secretion and absorption. Dr. James Joseph, chief neural scientist at Tufts University Anti-Aging Center, reported in the Journal of Neuroscience the power of **Blueberries** to reverse age-related changes in neuronal signal transduction, cognitive, motor and behavioral deficits. One of the most exciting of his discoveries was that not only did the blueberry extract provide antioxidant and anti-inflammatory power, but that it stimulated the expression of neurotrophic factor causing the re-growth of neurons and the increase of the dendritic nerve net. **With a population of 100 million nerves the enteric nervous system is the first to experience the detrimental effects of dietary toxins and infectious organisms, and also the first to experience the regenerative power of these antioxidant/anti-inflammatory/neuro-regenerative berry extracts.** (a full discussion of the wild blueberry extract is found in the BioImmersion web library)

Improved Bowel Habit

Inulin is a highly viscous non-digestible soluble dietary fiber and therefore increases faecal biomass and water content of the stools (stool weight is increased as much as 2 grams per gram of inulin ingested). **Raspberries** have more fiber than most fruit. Each raspberry is actually a small cluster of 75 to 125 fiber-rich seeds. One cup of raspberries gives 34% of the daily value (DV) of fiber. **Prunes** contain generous amounts of fiber plus a natural sugar called sorbitol that soaks up water. Prunes are excellent bulking agents.

Healthy bowel function is restored through the ingestion of healthy fiber, the reduction of oxidation and inflammation within the GI tract, the inhibition of gut pathogens and through the repair of nervous tissue within the enteric nervous system, thereby enabling normal peristalses. The High ORAC Synbiotic Formula is comprised of all the elements necessary to repair, heal and support the bowel.

Therapeutic Foods Probiotic Formulas are 100% Pure

BioImmersion Inc. utilizes 21st Century microbiological research, food chemistry and food technology science to develop and manufacture the Therapeutic Foods Line of synbiotic formulas. All formulas are manufactured without any excipients. Each powder or capsule contains only 100% pure probiotic bacterial blend and the special therapeutic foods. Our products are extensively and properly analyzed and documented to ensure consistent delivery of the highest levels of active ingredients.

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