

"The original research behind RAIN SOUL"



Creation of Super-Potent Antioxidant Values Through Synergy of Cold-Pressed Botanic Oils for Therapeutic Purposes

By Arnold S. Leonard, MD, PhD; Dan Saltzman, MD, PhD; and Mark Mueller

Free radicals are atoms or molecules with open negative charges capable of damaging the human body. Free radicals are produced as a result of metabolism, by dietary imbalances or pollutants, or from inflammation and biochemical reactions in the body, that can increase the probability of viral infections or cancer.

Long-term presence of these oxidizing radicals eventually can be detrimental to the human body. Oxidative stress also is thought to play an important role in numerous chronic diseases, such as coronary heart disease and cancer. Although there are many factors in the development of these diseases, considerable experimental evidence has linked the production of free radicals to biologic damage that can provide a basis for the beginning, as well as the progression, of certain diseases. When free radicals exceed the body's capacity to protect or repair itself, oxidative damage can occur. Penetration of the cell membrane over time leads to oxidative damage to organelles.

Antioxidants, which reduce oxidative stress, might play a role in the prevention or treatment of many diseases, and also might slow the progression of aging. The accumulation and growth of free radicals in the body often occur in association with a suppressed immune system, including infections such as HIV, SARS, cancer and heart disease. Diets high in added antioxidants have been shown experimentally to be protective against cancer and various diseases. Damage to the heart also has been shown experimentally to be reduced with increased dietary antioxidant intake.

Cold-pressed plant seed oils that can be extracted from seeds and other parts of various plants have been found to be excellent sources of antioxidants. In addition to traditional antioxidants such as vitamins C and E, plant oils contain phenolic compounds which are excellent free radical scavengers due to their electron structure. Plant seed oil extraction, carried out in an oxygen-deprived environment, yields excellent quality oil as compared to traditional high-temperature and solvent extraction methods. When using **cold pressing**, nothing is added to the seed or to the oil. The oils are potent, pure and unadulterated. Without solvents, bleaching agents or high temperatures, these legendary botanical seeds release their nutrient-dense oil containing a diverse array of nutrients, including **omega-3 essential fatty acids and potent antioxidants**. Oils produced by this process might accelerate the activity of the immune system and could play a role in moderating the aging process.

ORAC is an analytical measurement that represents the total antioxidant value of an oil-soluble or water-soluble substance, and demonstrates the potency created by the cold press process. Lab data at the University of Minnesota, collaborated by

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work at the University of Maryland and by Brunswick Laboratories, has verified the ORAC values and vitamin E content. Independent work at the University of Minnesota demonstrates the effect of the high-antioxidant cold-press oils in stimulating a marked increase effect on the immune system (evaluating T8 and NK cells) when the organism is subjected to foreign tumor cells. The oils of black raspberry seed and black cumin catalyze and are synergistic in reducing liver metastasis in a colon cancer experimental model using genetically engineered bacteria with an attached human Interleukin-2 gene. These experiments and others verify the potency of the cold-press oils and their therapeutic effect on boosting the immune system.^{1,2}

Collaborative effort with the University of Maryland also has demonstrated a higher inflammatory index of a number of the cold-press oils than aspirin, without the complications associated with the latter.³ Used properly, these oils and others carried out in an oxygen-deprived environment should be advantageous in the support of the immune system and in certain problems where inflammation occurs. Recent laboratory observations have demonstrated a phenomenon of antioxidant synergism when black cumin oil is combined with other oils. The antioxidant values of combined black cumin oil and other oil are increased over the expected weighted average of the individual component parts. Also, when more than two oils are added to the black cumin oil, an even higher antioxidant level occurs than would be expected again by the weighted average. These super-potent antioxidant values in blends of black cumin and other oils can be added to our armamentarium for hopefully preventing many disease processes from progressing. **It also is important to recognize that the common oils sold over the counter, such as canola, sesame seed, flax, and sunflower, have low antioxidant values when compared to the cold-press oils with synergism.**

It follows that multiple antioxidants are thus better than single antioxidants - an observation known for many years. The "timing" or modulation of the immune system and neutralization of free radicals by this important observation, producing higher antioxidant levels of well-recognized nutrients, might play a role in moderating the aging process and affect a number of diseases produced by a gradual increase in free radicals.

It also is important to recognize the overall role of black cumin oil in this process. This oil, containing the antioxidant thymoquinone, which in turn promotes the production of prostaglandins E1, is the modulator of the immune T-cell response. Black raspberry oil also modulated the immune response by increasing T8 and NK cells in a colon cancer model at the University of Minnesota. Clinical trials are underway to evaluate these observations.

Lipid-Soluble Antioxidant Capacity

Cold-Pressed Oils: Synergy of Black Cumin With Other Oils

Multi-antioxidants, with addition of black cumin produced by plant seed oil extraction, can yield super-potent antioxidants greater than their weighted averages (synergism). Black caraway adds stability.

(see attached SEED OIL CHART & ORAC CHART)

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References

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2. Soto, LJ, Sorenson, BS, Nelson, BW, Leonard, AS, Saltzman, DA: Generation of immunity to hepatic metastases by attenuated *Salmonella typhimurium*. *Ann Surg Onc*, 2004;11(2) suppl: S107.
3. "Use of Specialty Cold Pressed Edible Seed Oils, Flours and/or Their Blends as Anti-Inflammatory Agents. Liangli Yu, PhD. University of Maryland, Mark Mueller, Botanic Oil Innovations, Inc. 2005. Unpublished paper.

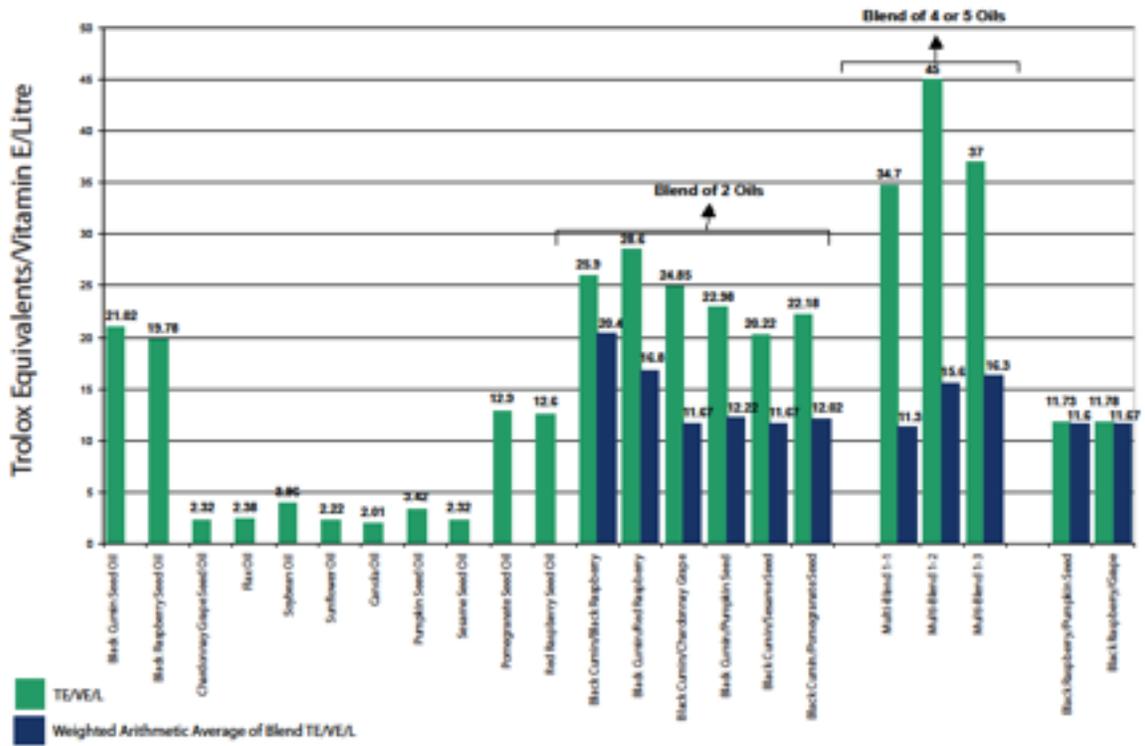
About the Authors:

Arnold S. Leonard, MD, PhD, graduated from the University of Minnesota Medical School in 1955 and received his PhD in 1963. While in medical school, he worked in the operating room during the first open-heart surgery. He has given more than 60 national and international talks and authored more than 250 peer-reviewed publications. Dr. Leonard's research laboratory at the university has received two American College of Surgeons awards and the Watson Award for innovative approaches in boosting the immune system. He holds an Endowed Chair in Pediatric Surgery in the department of surgery and continues to research genetic engineering and synergism for tumors and nutraceuticals for immune boosting.

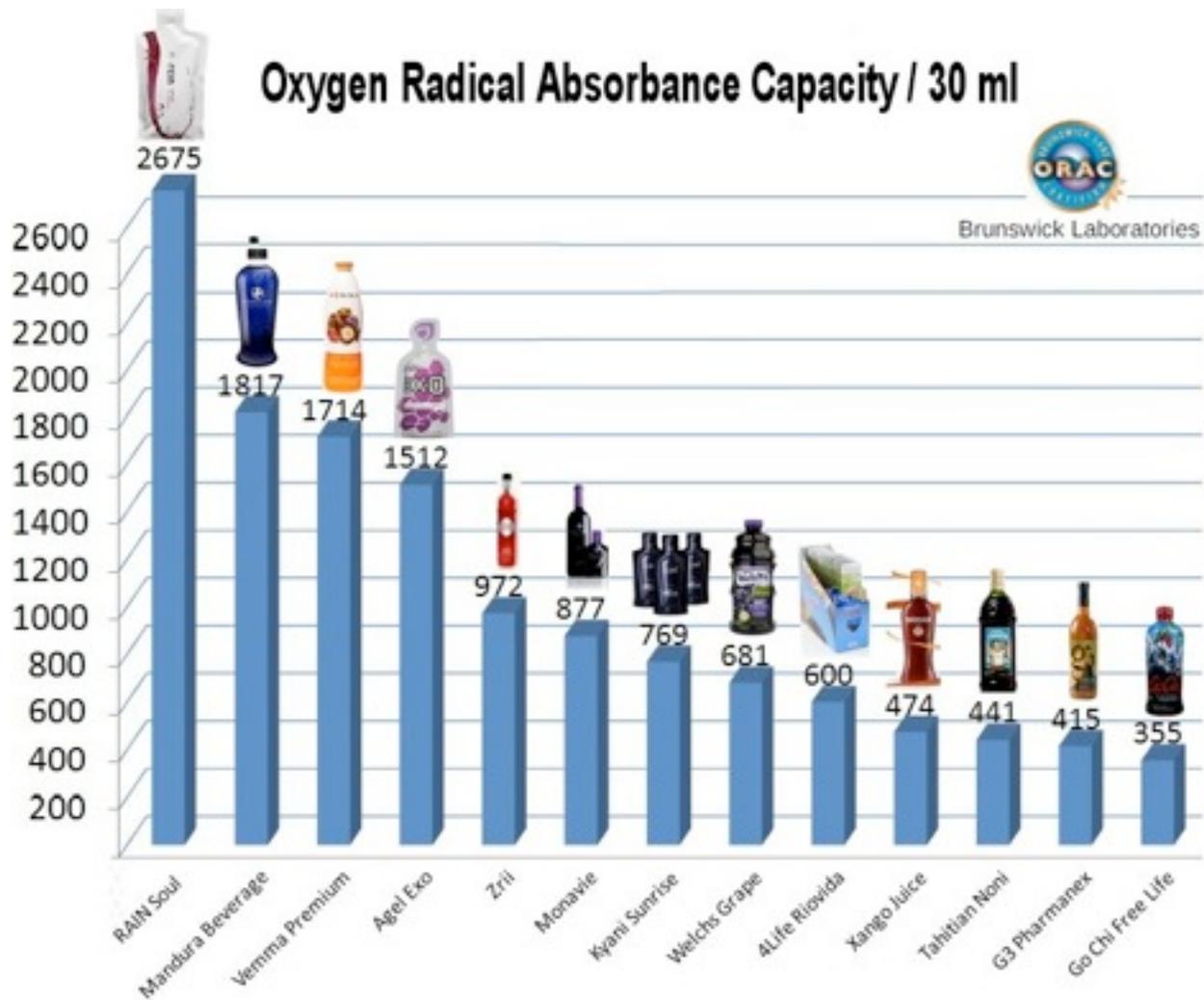
Dan Saltzman, MD, PhD, is Chief of Pediatric Surgery and holds the Dr. Arnold S. Leonard Endowed Chair in Pediatric Surgery at the University of Minnesota Medical School. In addition to maintaining an active clinical practice, Dr. Saltzman focuses research efforts on biologic vectors to deliver Interleukin-2 to incurable cancers and the immunologic and anti-tumor potential of highly potent antioxidant fruit seed oils. He has more than 50 published manuscripts and numerous book chapters. He also is the recipient of the American Surgical Association Foundation Fellowship Award.

Mark Mueller founded Botanic Oil Innovations in 1999, a startup company using cold-press technology to extract high valued phytochemicals from plant materials. The company has undertaken pioneering work for the commercialization of lipid and water-based extracts for medical and dietary supplement applications. The company also is developing novel extraction processes to preserve the natural integrity of the botanical materials.

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What is ORAC score?

An Oxygen Radical Absorbance Capacity (ORAC) score is a test tube analysis that measures the antioxidant levels of food and other chemical substances. If a food has a high ORAC score, then it means the food is high in antioxidants.

The antioxidant's strength is its ability to eliminate oxygen free radicals. With the ORAC score, a higher score means the food is better at helping us fight diseases such as heart disease and cancer. Foods with a high ORAC score may be able to protect cells and their components from oxidative damage. Oxygen radicals are chemicals that form naturally inside the body through the process of oxidation.

Everyday functions such as digestion and physical activity produce oxygen radicals. Daily exposure to polluted air, rancid food and oxidizing radiation from the sun and electrical appliances also contribute.

An easy to understand example of oxidation is to imagine rust attacking metal. When the rust eats away at the metal, the metal starts to weaken and decay until it can no longer work. This is what happens to our body when free radicals attack it. Organs, cells and other parts of the body can be weakened by oxidation. This leads to diseases such as cancer, skin and heart diseases, senile dementia and osteoarthritis.

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