



⇒ Product Review ⇐

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REDOX SELECT™ – A NEW ANTIOXIDANT PRODUCT FROM MOSS NUTRITION

As with all of my product newsletters featuring new products, I like to feature published research papers that highlight a particular positive aspect or ingredient in the product, from a very basic practical and clinical standpoint, that would be relevant to you, our customers. With this goal in mind, I was amazed, despite spending a good amount of time on PubMed doing literature searches, how hard it was to find positive clinical research on products featuring a combination of antioxidant nutrients such as **Redox Select™**. In contrast, the vast majority of studies I found concluded that antioxidant supplements were either ineffective at preventing various chronic illnesses or actually detrimental to health. After reading several of these studies I started thinking long and hard about their true message. Of course, on the surface, as many have concluded, it appeared that the conclusion was that oral ingestion of these nutrients was inherently bad, to be avoided at all costs. Unfortunately, the same papers that were condemning antioxidant nutrients in pill form were praising them when ingested in food form. Therefore, none of the papers were suggesting that the nutrients were inherently bad. What were they suggesting (at least to me) based my reading? First, there is a gross misunderstanding among the general public, manufacturers of antioxidant supplements, and many nutritionally oriented practitioners about the true role of oxidants or “free radicals” in the body. Second, there seems to be a complete lack of attention to a simple concept I have discussed ad nauseum in this forum for years: ***Dose matters!!***

Therefore, I would now like to discuss each of these often ignored and/or misunderstood aspects of oxidants and antioxidant nutrients. From there, I would like to discuss what I feel is intelligent use of **Redox Select™** which, to me, is not a “holy grail” of sorts that guarantees long life and avoidance of all chronic illnesses, as is suggested by many companies who manufacture similar products. In contrast, it is a product that can be of great benefit to many chronically ill patients, when applied in accordance with sound principles of oxidant chemistry and genuine dietary need due to increased allostatic load from a whole variety of environmental stressors including diet.

My resource for this discussion will be a book chapter entitled “Acute and chronic effects of antioxidant supplementation on exercise performance” by Bentley et al (Bentley DJ et al, in Lamprecht M ed., *Antioxidants in Sport Nutrition*, CRC Press, Boca Raton, FL, 2015). Why am I referencing an article on exercise stress when I suspect that, for most you, you will be considering use of **Redox Select™** for patients experiencing an exact opposite form of stress, lack of exercise? As I have mentioned so often before, all forms of stress elicit virtually the same metabolic response in the body, including the responses related to oxidant/antioxidant physiology. Therefore, the impact of too much exercise on oxidant/antioxidant chemistry is virtually the same as too little exercise.

Some realities of oxidant chemistry and physiology

The key, overriding sound bite in this section is that, contrary to popular opinion, oxidation is not a “dirty word.” Oxidation is not inherently “evil” and something we need to completely eliminate at all costs with antioxidant

supplements or anything else. For, the reality is that oxidation is an essential for energy production for a large volume of life forms on earth – one obvious example being oxidative phosphorylation. Rather, like everything else on earth, including water, oxidation only becomes an issue when there is too much of it. Furthermore, contrary to popular opinion, not everybody has too much of it. With this introduction in mind, I would like to take a look at oxidation not from the usual hype from the media and supplement industry but from the physiologic and biochemical reality standpoint as discussed in the above mentioned paper.

Bentley et al begin their paper with a general discussion on free radicals and the role of antioxidants:

“Reactive oxygen and nitrogen species (RONS), also known as free radicals, are continually produced within the body as part of normal oxidative metabolism. These molecules act as intracellular messengers and are necessary for proper physiological function. However, high concentrations of RONS can be toxic and cause significant oxidative damage to the cellular structure of lipids, protein and DNA. The concentration of RONS within the body is controlled by an extensive antioxidant system, which works to scavenge free radicals. Antioxidants (AOX) are present in both the intra- and extra-cellular matrix forming a complex defence system to protect cells and tissue against oxidative damage. The antioxidant defence system is commonly divided into enzymatic (endogenous) and non-enzymatic (exogenous) AOX.”

Before continuing, please note again from the above quote that RONS are “necessary for proper physiological function.” It is only when RONS are present in excess do they create problems. Therefore, it would seem to make sense that introduction of antioxidants to an individual within knowing his or her RONS status could conceivably lead to adverse effects.

What happens to the oxidant/antioxidant relationship when a significant environmental

stressor such as excessive exercise is introduced? Consider the following:

“Prolonged exercise training induces marked changes in physiological function and skeletal muscle contractile performance. The oxidant – antioxidant balance during exercise has been shown to greatly influence muscular contraction and adaptation to physical training. It has been proposed that optimizing skeletal muscle oxidant concentration by consuming antioxidant substances (acutely) results in greater force production and power output during prolonged high-intensity endurance exercise. However, studies have also shown that physiological adaptations to exercise may be blunted when oxidant production is suppressed.”

As suggested in the above quote, there is no question that excessive oxidant stress can be detrimental to muscle health:

“An elevated concentration of oxidants within the skeletal muscle may cause oxidative damage to the mitochondria and muscle contractile proteins, interfering with the excitation-contraction coupling process.”

Because of this increased oxidation that occurs during prolonged exercise, the body possesses an elaborate antioxidant enzyme system that is not designed to eliminate all free radicals but to reestablish balance so that, no matter what the exercise level, there exists enough RONS to support optimal muscle function but not so much that free radical generated damage will occur. Bentley et al state:

“In order to prevent the occurrence of severe oxidative damage during exercise, the body must continually re-enforce its antioxidant protection. Physiological adaptation to oxidative stress relies on the process of redox signaling. When an increased production of RONS occurs, redox signaling is used to induce protective mechanisms, predominantly the up-regulation of antioxidant responses, to restore the redox homeostatic balance. During exercise, the redox balance is disturbed due to the exercise-induced increase in free radical production. This initiates a redox signaling cascade, which leads to an increase in antioxidant enzyme expression and

facilitates the mobilization of exogenous antioxidants.”

Nevertheless, with all of the above in mind, maintaining oxidant/antioxidant balance is critical for optimal function:

“The balance between oxidant production and antioxidant removal is vital to the regulation of cellular functions. Low concentrations of free radicals are necessary for proper regulation of cellular function, but higher concentrations can lead to cellular damage and oxidative stress.”

Of course, as I suggested above, oxidant stress can occur with many other situations other than excessive exercise:

“A pro-oxidant shift in redox homeostasis has been observed in several pathological diseases such as diabetes, cancer, rheumatoid arthritis and ageing.”

Can antioxidant supplements be helpful in restoring oxidant/antioxidant balance with over exertion? The authors state:

“Antioxidant substances may help neutralize free radicals and thereby prolong skeletal muscle integrity and prevent a decline in performance.”

Unfortunately, inappropriate supplementation of antioxidants that drops oxidant levels too low can be detrimental:

“It has...been suggested that antioxidant supplements may be able to assist exercise performance by reducing the excessive exercise-induced oxidative stress response. However, other important chronic physiological adaptations to exercise may be blunted if skeletal muscle oxidant concentration is too low.”

WHO WOULD BEST BENEFIT FROM THE INGESTION OF REDOX SELECT™?

As has been pointed out above in the Bentley et al paper and numerous other studies over the last few years, the popular message put out by the media, supplement companies, and many nutritional practitioners over the last several decades is that everyone should be ingesting

antioxidant supplements on a regular basis because of the clear and unmistakable chance of benefit and minimal to no chance of risk, is not a valid healthcare claim. In contrast, the reality is that mass ingestion by the population at large of antioxidant supplements will lead to many individuals either experiencing no benefit at best and adverse effects at the worst.

Nevertheless, even though the reality of antioxidant supplements is that they fall well short of the universal panacea proclaimed by many, as suggested by Bentley et al there are growing numbers of people who will benefit from ingestion. Who are they? Interestingly, they are the people we see in our practices every day with chronic illnesses such as diabetes, rheumatoid arthritis, etc.

A good example of individuals who, due to increased oxidant stress, demonstrated value from antioxidant supplementation is featured in the recently published study “Reactive oxygen and nitrogen species in patients with rheumatoid arthritis as potential markers for disease activity and the role of antioxidants” by Khojah et al (Khojah HM et al, *Free Rad Biol Med*, Vol. 97, pp. 285–291, August 2016). The first quote I would like to feature from this paper affirms what was stated above by Bentley et al that increased free radical activity plays a major role in chronic illness:

“Now, it has been established that the free radicals involving reactive oxygen species (ROS) and reactive nitrogen species (RNS), play an important role in rheumatoid arthritis inflammation (RA).”

With the above in mind, the authors hypothesize that antioxidants would be helpful for RA inflammation:

“In order to suppress RA inflammation, it is desirable to eradicate these reactive species that are formed excessively at the inflammatory sites. Therefore, the use of antioxidants as adjuvants may be of benefit in this regard. By broad definition, an antioxidant is any substance that, even if present at low concentrations, significantly prevents or delays the oxidation of its substrates.”

To test this hypothesis, the authors studied 42 RA patients who ingested 1 gram of ascorbic acid per day for 2 months in addition to RA drugs. What were the results? First, as expected, the RA patients demonstrated higher levels of free radicals compared to healthy controls:

“The present results demonstrated a statistically significant increase in all individual ROS in sera of RA patients compared with the healthy control subjects. This may be attributed to the possible role of these reactive species in the inflammatory reaction of RA.”

In addition, the RA patients demonstrated significantly higher levels of reactive nitrogen species (RNS):

“The role of nitrative stress, represented by the significant increase in the concentrations of the individual RNS in RA patients has been documented in this study.”

With these results in mind, Khojah et al conclude that there is a strong correlation between indicators of free radical activity and other markers of RA typically seen in RA patients:

“In general, the present data have shown moderate to strong positive correlations between most of the individual reactive species (ROS and RNS) and the clinical and biochemical markers of RA, a finding that is reported for the first time by this study.”

What was the impact of the ascorbic acid supplementation? The authors note:

“...the levels of ROS and RNS were significantly reduced after treatment with ascorbic acid. This inhibition of the reactive species by ascorbic acid may confirm the possible usefulness of antioxidants in the management of RA.”

Did the ascorbic acid supplementation demonstrate any other benefits? Most certainly!!

“Moreover, most of the investigated RA biomarkers were significantly reduced after this treatment.”

These findings led Khojah et al to conclude:

“Hence, it was suggested that co-administration of ascorbic acid with the disease-modifying antirheumatic drugs (DMARDs) may enhance the oxidant/antioxidant balance and hasten the recovery from the disease.”

With the above in mind, to whom do we suggest you recommend the use of **Redox Select™**? Our answer is not “Everyone” as might be suggested by many supplement manufacturers and nutritionally oriented practitioners. Rather, based on what I consider to be several reliable studies, we suggest that you recommend **Redox Select™** to any patient suffering from chronic illnesses that exhibit an inflammatory component. Which illnesses demonstrate an inflammatory component? For me, based on the massive amount of research I have read on the subject over the last few years, I would say all of them.

For further information about **Redox Select™**, please review the enclosed Technical Sheet, contact our office, or visit www.mossnutrition.com.

Redox Select™ - Moss Nutrition

Contents: 60 Vegetarian Capsules

