

What Are 'Free Radicals' and How Can the Body Defend Itself From Them With Supplemental Antioxidant Enzymes?



INTRODUCTION

Keeping current about health, fitness and life extension in the 1990's means adding some new terms to your vocabulary. This decade brings with it an explosion of research and writing about "Free Radicals" and "Free Radical Pathology", "Antioxidant Enzymes and Live Enzyme Foods". What follows is a primer on this burgeoning area of science to help you make sense of what you read in the future.

WHAT ARE FREE RADICALS?

Like all matter, our bodies are composed entirely of tiny particles called molecules. Each molecule is made up of atoms, and each atom is made up of a center or nucleus and electrons which spin in orbits around it.

Ordinarily, the electrons occur in balanced pairs. This keeps the atom and molecule stable. Sometimes a molecule loses one of its electrons or gains an extra one. This causes the molecule to become unbalanced and highly reactive. Such a molecule is called a 'Free Radical'.

WHERE DO FREE RADICALS COME FROM?

Some 'Free Radicals' occur as normal by-products of a healthy body's metabolic processes. Overproduction of "Free Radicals" occurs when the body is subjected 'Stress' in any of its forms:

- 1) Chemical
- 2) Emotional
- 3) Physical
- 4) Infectious

Common Sources of 'Stress to the Body' are:

- Aging • Environmental Pollutants • Trauma •
- Disease • Pace & Pressure of Modern Life •

HOW DO FREE RADICALS HURT THE BODY?

Having unpaired electrons is not an energetically favorable or stable state for a molecule. A 'Free Radical' will naturally try to return to a state of stability by taking an electron from some other molecule and restoring its own balance. It is this little act of thievery that causes the damage. The stolen electron may be from a molecule in a normal healthy cell. This process of 'Cell Damage' continues to multiply if not checked. The end result is that the healthy cells are damaged and the body's proper functioning is impaired.

Unfortunately today, the increased stresses of modern life combined with age and the nutritional inadequacies of a contemporary diet result in an excess of free radical activity in the body and a deficiency in the available supply of antioxidants to remove them. This negative state is known as 'Free Radical Pathology'.

HOW DOES THE BODY DEFEND AGAINST FREE RADICALS?

Nature equips the body to produce special enzymes called 'Antioxidants' which catalyze the removal of the 'Free Radicals' before they can cause serious cellular damage. Under normal conditions these naturally occurring 'Antioxidant Enzymes' can handle the 'Free Radicals' produced by the body's own normal metabolic processes.

In addition, nature allows the body to acquire additional supplies of these antioxidant enzymes from certain raw foods.

WHICH FOODS INCREASE LEVELS OF ANTIOXIDANT ENZYMES?

Certain whole, natural, 'Live Foods' which are rich in enzymes themselves have been shown to stimulate the body's own production of antioxidants.

However, it's not always convenient to eat fresh whole foods, and unless you grow your own, the nutritional value of those you do eat may be questionable. Modern agricultural practices have greatly depleted the nutritional value of the foods we eat, even raw fresh foods. Today, vegetables are bred for longer shelf life, convenience in shipping and high yield, not necessarily for high nutrition. Important trace elements and other co-factors which make the enzymes usable to the body often are missing. The nutritional content is even further reduced by the heat of cooking which destroys the live enzymes.

The 'Live Enzyme' foods that provide the best sources of antioxidant enzymes include; Raw Vegetables, wheat grass, barley grass, sprouts and blue-green algae.

WHAT IS THE BEST WAY TO GET 'LIVE ENZYME FOODS'?

Fortunately, recent years have brought some very beneficial research and new technological developments in plant management.

Botanists at Biotec Foods have developed enhanced strains of hydroponically grown wheat sprouts which are enzyme-rich and which have been shown to increase the endogenous production of antioxidant enzymes in the human body. These sprouts are dehydrated at low temperatures to prevent damage to the live enzymes and then highly concentrated and compressed into a convenient tablet form.



These 'Live Enzyme' food supplements from Biotec are available under several product names. Each product formula is specially blended with "IsoSproutplex™" to provide the required antioxidant enzyme protection based on your own personal activity and needs.

Thanks to Biotec, you don't need to have your own organic farm to enjoy the benefits of eating 'Live Enzyme Foods'. The nutrition you need is as convenient as your local health food store or pharmacy.



TEST STUDIES

Effects of "Whole Live Foods" on (SOD) Deficiency in 10 Adult Humans

BLOOD TEST RESULTS

Of a study on natural superoxide dismutase (SOD) levels before and after addition of hydroponically grown foods by Biotec Food, HI.

Conducted by Dr. Peter Rothschild M.D. Ph.D. et al. Testing by Smithkline Bio-Science, Honolulu, HI. Antioxidant enzymes supplied by Biotec Food, HI. Normal ESOD values: 9.4-13.4 units/mg. Hb.

ABSTRACT

The erythrocyte superoxide dismutase (ESOD) levels of 10 human adults were tested before and after addition of whole foods expected to enhance endogenous production of superoxide dismutase (SOD) and catalase (CAT).

MATERIALS AND METHODS

Each person was in normal health with no diagnosed diseases. Written permission from each patients physician was required prior to participation. Each persons diet was supplemented with 6 tablets upon rising in the a.m., 1 hour before eating for the first two weeks; with 3 tablets daily for the second two weeks on a 4 week schedule. The product used was a whole food developed from specially grown sprouted wheat, which in preliminary tests had the effect of enhancing endogenous production of superoxide dismutase (SOD) & catalase (CAT).

Patients Name	Age/Sex	Dates Tested	Test Results	% of Change
Robert Ronac	68/M	2/6/89	*2.23	61% Increase
		2/21/89	3.6 units/mg.Hb	
		3/30/89	11.3	
Curtis Bevins	67/M	2/14/89	*1.26	273% Increase
		2/28/89	4.7 units/mg.Hb	
		4/8/89	8.3	
Eugene Carson	65/M	1/30/89	*2.0	259% Increase
		2/13/89	7.18 units/mg.Hb	
		3/16/89	7.94	
Oral Mathews	69/F	2/10/89	*3.27	218% Increase
		2/21/89	10.4 units/mg.Hb	
		3/7/89	1.6	
Louise Bonner	76/F	2/9/89	*1.58	261% Increase
		3/8/89	5.7 units/mg.Hb	
		4/12/89	13.7	
Hildegard Bevins	67/F	2/14/89	*6.37	32% Increase
		2/28/89	8.4 units/mg.Hb	
		4/18/89	9.3	
Evelyn Giddings	65/F	2/9/89	*2.39	193% Increase
		3/8/89	7.0 units/mg.Hb	
		4/11/89	7.17	
Muriel Saito	70/F	2/22/89	*<1.0	730% Increase
		3/20/89	8.3 units/mg.Hb	
		4/13/89	3.3	
Lily Nishi	76/F	2/23/89	*4.1	188% Increase
		3/9/89	11.8 units/mg.Hb	
		3/24/89	4.4	
Maxine Lum	69/F	2/16/89	*4.78	76% Increase
		3/9/89	8.41 units/mg.Hb	
		4/7/89	9.53	

CONCLUSION

The unique form of superoxide dismutase (SOD) and related essential co-nutritional factor found in the products utilized in this study enhanced the endogenous erythrocyte levels of superoxide dismutase (ESOD) by an average of 230% overall increase in each of the tested persons.

* Pretest Blood Levels

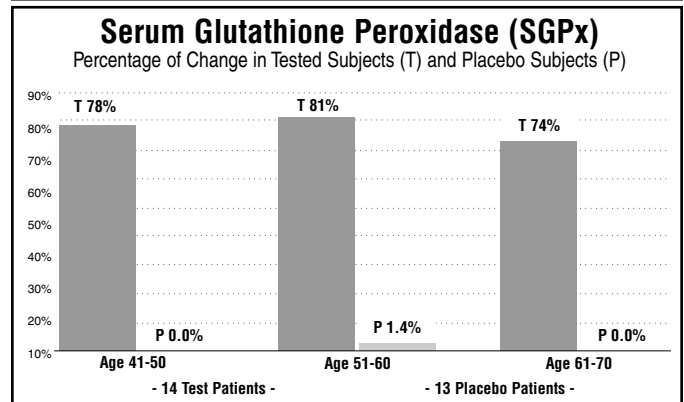
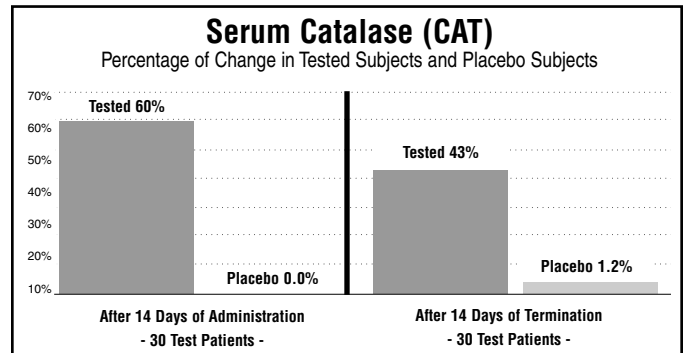
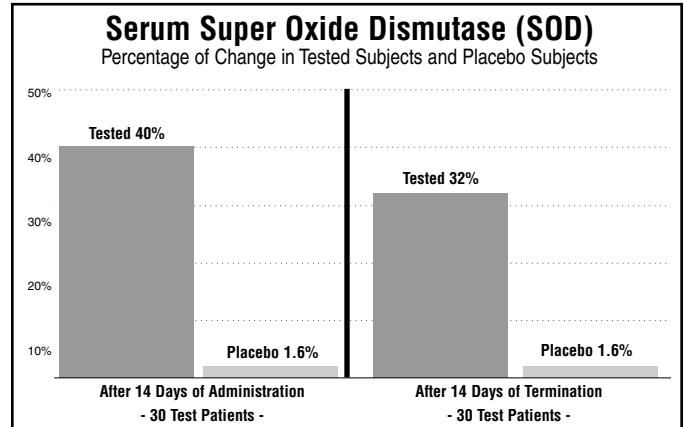


RESEARCH PROVES ANTIOXIDANT ENZYME LEVELS INCREASE

BLOOD SERUM STUDIES

In this study, blood samples of 70 subjects were analyzed before they began eating the 'Live Enzyme' food supplement supplied by Biotec. Testing took place again two weeks after beginning to use the 'Live Foods' and a third time after stopping use of the foods.

In this study, serum levels of antioxidant enzymes increased significantly in those subjects taking the 'Live Enzyme' foods, while placebo control subjects showed "No Significant Change". These results demonstrate that taking 'Live Enzyme' foods can indeed enhance the endogenous production of antioxidant enzymes in the human body.



Results of serum super oxide dismutase (SOD) and catalase (CAT) from Absorption Study with Cell Guard™/AOX/PLX®, Ordonez, L., Rothschild, P., Academia de Medicina, Francisco Villa 18, Las Palmas, Matamoros, Tamaulipas, Mexico, 1988. Testing procedures involved Fluorescence Fading Time and are described in detail by Rigo, a., Rotilo, G., *Determination of Super Oxide Dismutase and Catalase in Biological Materials by Polarography*, Anal Biochem., 81 (1) 157-66/1977Jul/MD=7712. Results of serum glutathione peroxidase (GPx) levels from study with Cell Guard™/AOX/PLX®, A. Esquivel, P. Rothschild, et al., National Autonomous university, Dept. of Immunology, Mexico City, 1988. Cell Guard™/AOX/PLX® was administered at 6 per day for 60 days. Enzyme levels were determined 30 days after termination as described by Pleban, PA, Munyani, A, and Beechum, J. *Determination of Selenium Concentration and Glutathione Peroxidase Activity in Plasma and Erythrocytes*. Dept. of Chemical Sciences, Old Dominion University, Norfolk, VA. Published in Clinical Chem., 28 (2) 311-6, Feb. 1982.